PREPARING FOR CHANGE IN THE FEDERAL INFORMATION TECHNOLOGY WORKFORCE

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Today's federal IT workers have a tremendous opportunity to participate in a new era of public service. The American people deserve and expect a government that is efficient, accountable, and fully worthy of their trust. The Administration is committed to leveraging the power of technology to deliver results.

VIVEK KUNDRA
FEDERAL CHIEF INFORMATION OFFICER
AND DIRECTOR, CIO COUNCIL

The information age provides us opportunities to collaborate in ways we never dreamed possible. But the promise of the future rests firmly in the hands, hearts, and minds of our workforce. It is imperative that the Federal Government attract and retain the "best and the brightest" of the workforce of the future – the "Net Generation." And this will only happen if we are able to provide our workforce with access to information age tools and capabilities, as well as providing them with an environment that unleashes and nurtures the fire of their innovation and creativity.

DAVID M. WENNERGREN
DEPUTY CIO, DEPARTMENT OF DEFENSE
AND VICE-CHAIR, CIO COUNCIL

introduction

The increasingly senior federal workforce, and their anticipated retirement from federal service, continues to top the list of human capital concerns across government. The Federal Government needs the right mix of high performing information technology (IT) personnel, with the skills necessary to meet both current and future mission requirements. As the Baby Boomers in the federal IT workforce retire, many of their replacements will come from a new, younger generation of workers, the "Net Generation," so-named by Don Tapscott in his 1997 book, *Growing Up Digital: The Rise of the Net Generation (*and its 2008 sequel, *Grown Up Digital: How the Net Generation is Changing Your World*), for being the first generation to have lifelong exposure to the Internet. This large, incoming generational wave is expected to bring a variety of new dynamics to the federal workplace. In order to manage the changing generational mix effectively, managers will need to reconcile the distinct, and sometimes conflicting, expectations, needs, and life experiences of their workforce and to establish a context for success that allows the strengths of each generation to shine.

Capturing the knowledge of the current workforce, and bracing for the institutional changes resulting from both a changing workforce and rapidly evolving technology, will present wide-ranging challenges for Chief Information Officers who must fulfill specific responsibilities under United States Code (USC) 11315(c)(3) (Clinger-Cohen Act); 44 USC 3506(b)(5) (Paperwork Reduction Act); 44 USC 3501, Section 209, IT Workforce Development (E-Government Act); 44 USC 3544(a)(4), Information Security (E-Government Act); and OMB A-130 Circular regarding the assessment, management, and training of the federal IT workforce. Accordingly, the Federal Chief Information Officers Council initiated a review of the baseline federal IT workforce, current IT workforce management practices, and collaborated with nGenera Insight (formerly New Paradigm), an innovator in generational thought research, to use and expand their research on the Net Generation, the workforce of the future. The Office of the Department of Defense Deputy Chief Information Officer has spearheaded this effort for the Council.

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defining the federal IT workforce

During the past ten years, information technology has become integral to almost every job performed within the Federal Government. The automation of functions and services once performed manually, and the increasing requirement for integrated information, systems, and technologies, have broadened the scope of functions and equipment that comprise the definition of information technology (IT), and the range of occupational series that can be considered as part of the federal civilian IT workforce community.

As defined in title 40 of the United States Code, with respect to an executive agency in the Federal Government, IT is "any equipment or interconnected system or subsystem of equipment used in the automatic acquisition, storage, analysis, evaluation, manipulation, management, movement, control, display, switching, interchange, transmission, or reception of data or information by the executive agency, if the equipment is used by the executive agency directly or is used by a contractor under a contract with the executive agency that requires the use of that equipment or of that equipment to a significant extent in the performance of a service or the furnishing of a product. [This] includes computers, ancillary equipment (including imaging peripherals, input, output, and storage devices necessary for security and surveillance), peripheral equipment designed to be controlled by the central processing unit of a computer, software, firmware and similar procedures, services (including support services), and related resources; but does not include any equipment acquired by a federal contractor incidental to a federal contract." [1]

	Series	Employee Title
IT Operations and Information Resources Management	0332	Computer Operator
	0335	Computer Technician
	1410	Librarian
	1411	Library Technician
	1412	Technical Information Specialist
	1420	Archivist
	1421	Archivist Technician
	2210	IT Specialist
Engineering and Scientific	0854	Computer Engineer
	0855	Electronics Engineer
	0856	Electronics Technician
	1550	Computer Scientist
Communications	0390	Telecommunications Equipment Operator
	0391	Telecommunications Specialist
	0392	Telecommunications Technician
	0394	Communications Technician

Table 1.1 Federal Civilian IT Workforce

The federal civilian IT workforce includes government personnel across all federal agencies who provide workforce capabilities required to:

- Plan, budget, manipulate, control, and archive information throughout its life cycle.
- Develop, acquire, implement, evaluate, maintain, and retire information, information systems, and information technology, and the technology to transmit information.
- Develop the policies and procedures required for information resources management.
- Apply the measures that protect and defend information and information systems.

Occupational series that may be included in the federal civilian IT workforce are listed in Table 1.1; however, the definition of the IT workforce community may vary by agency, according to each agency's mission and the nature of its work. The Information Security or Information Assurance (IA) workforce is a subset of the overall IT workforce; individual IA members may be resident in many series, but are predominantly in several specialty areas within the 2210 or IT Management series. Work is ongoing to identify the impact of federal cyber initiatives on the IT workforce landscape.

> Developing the strategies and actions to recruit, develop, and maintain a best-in-class professional IT workforce has been a Federal Chief Information Officers (CIO) Council priority since the establishment of the Federal IT Workforce Committee in 1999. Over the past decade, we have witnessed tremendous growth and evolution within the federal civilian IT workforce. That evolution's going to continue, and so will the work of the Committee. Web 2.0 transformation will need a Talent 2.0 workforce with the right skills and an innovative, collaborative mindset.
>
> **JANET L. BARNES**
> CO-CHAIR OF THE FEDERAL CIO COUNCIL IT WORKFORCE COMMITTEE
> (2003–2009)

	Computer Specialists/ IT Specialists	Computer Scientists	Computer Engineers	Electronics Engineers	Telecom Specialists
1997 [2]	55,301	3,204	2,400	23,566	6,904
2008	68,626	5,404	4,203	19,302	5,787
Percent Change	24%	69%	75%	-18%	-16%

Table 1.2 Major Federal IT Population Trend

The focus of this report, commissioned by the Federal CIO Council, is on selected employees from the larger communities within the federal civilian IT workforce, namely, IT Specialists, Computer Scientists, Computer Engineers, Electronics Engineers, and Telecommunications Specialists. Together, these communities totaled 103,322 personnel in Fiscal Year (FY) 2008. For the purpose of this report, these five series will be known as the "Major Federal IT Population" or "Major Federal IT Community." Table 1.2 provides the aggregate populations of these series, comparing FY2008 figures from the Office of Personnel Management's (OPM) online tool, FedScope, against published FY1997 OPM data. The distribution of FY2008 employees by Federal CIO Council member organizations is contained in Appendix A.

current workforce environment

Demographically, the federal civilian IT workforce spans five generations: the G.I. Generation, born before 1925; the Silent Generation or "Greatest Generation," born 1925 to 1945; the Baby Boom Generation, born 1946 to 1964; Generation X (or Gen X), born 1965 to 1977; and the Net Generation (also called Generation Y or the Millennials), born between 1978 and 1994 (or even as late as the year 2000, depending on the demographic study). For the purposes of this report, the above definitions apply, however, individual tables and charts may differ slightly, depending on how the obtainable federal data was aggregated.

As Figure 2.1 illustrates, there are federal civilian IT workers located in every state in the Union. Additionally, in Fiscal Year (FY) 2008, there were 244 individuals in the U.S. territories and 1,727 employed in foreign countries who were part of the Major Federal IT Population.[1] Thirty-four percent of the Major Federal IT Population works in the Maryland/Virginia/District of Columbia region.

Figure 2.2 provides a generational view of the Major Federal IT Population. The "Pre-Baby Boom" includes two generations, the G.I. Generation and the Silent or "Greatest Generation." The Greatest Generation are age 64 to 84. They are not a large segment of the workforce population, but their knowledge is valued. Additionally, there was a very small cadre of the G.I. Generation, aged 85 and above, in the Major Federal IT Population in FY2008, 14 individuals in total.

The Boomers, by far the largest segment of the IT workforce, span from age 45 to 63. In 2008, the first wave of the U.S. Baby Boomers became eligible for social security benefits. As more of these individuals become eligible to retire, there is great potential for a cascade of retirements over the next decade or more, from both the general U.S. population and the Federal Government. This will have many impacts: the need for additional recruiting and creative retention incentives; additional training and education requirements; and, many opportunities for advancement. Given this scenario, succession planning should play a fundamental role within every IT organization.

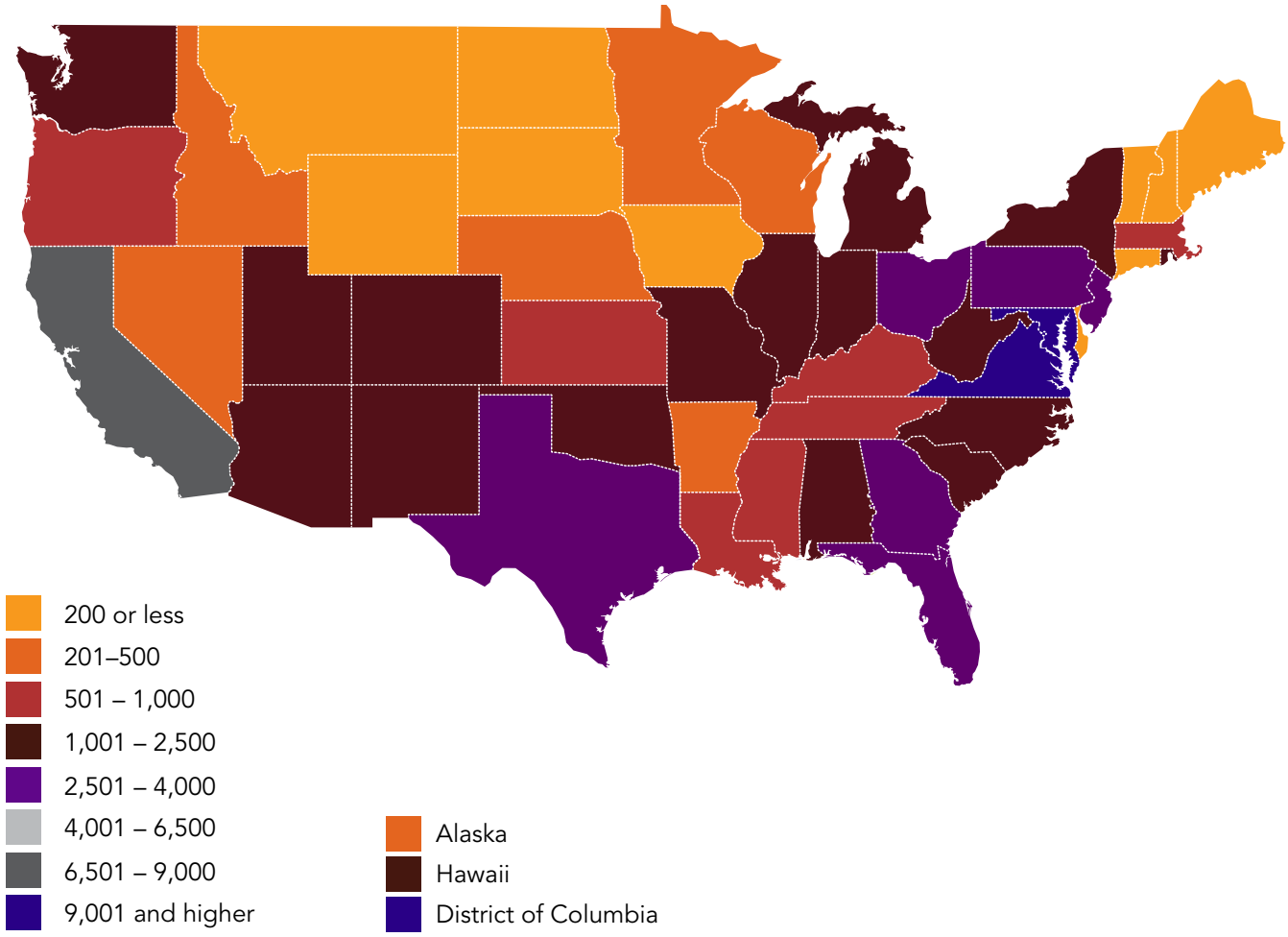
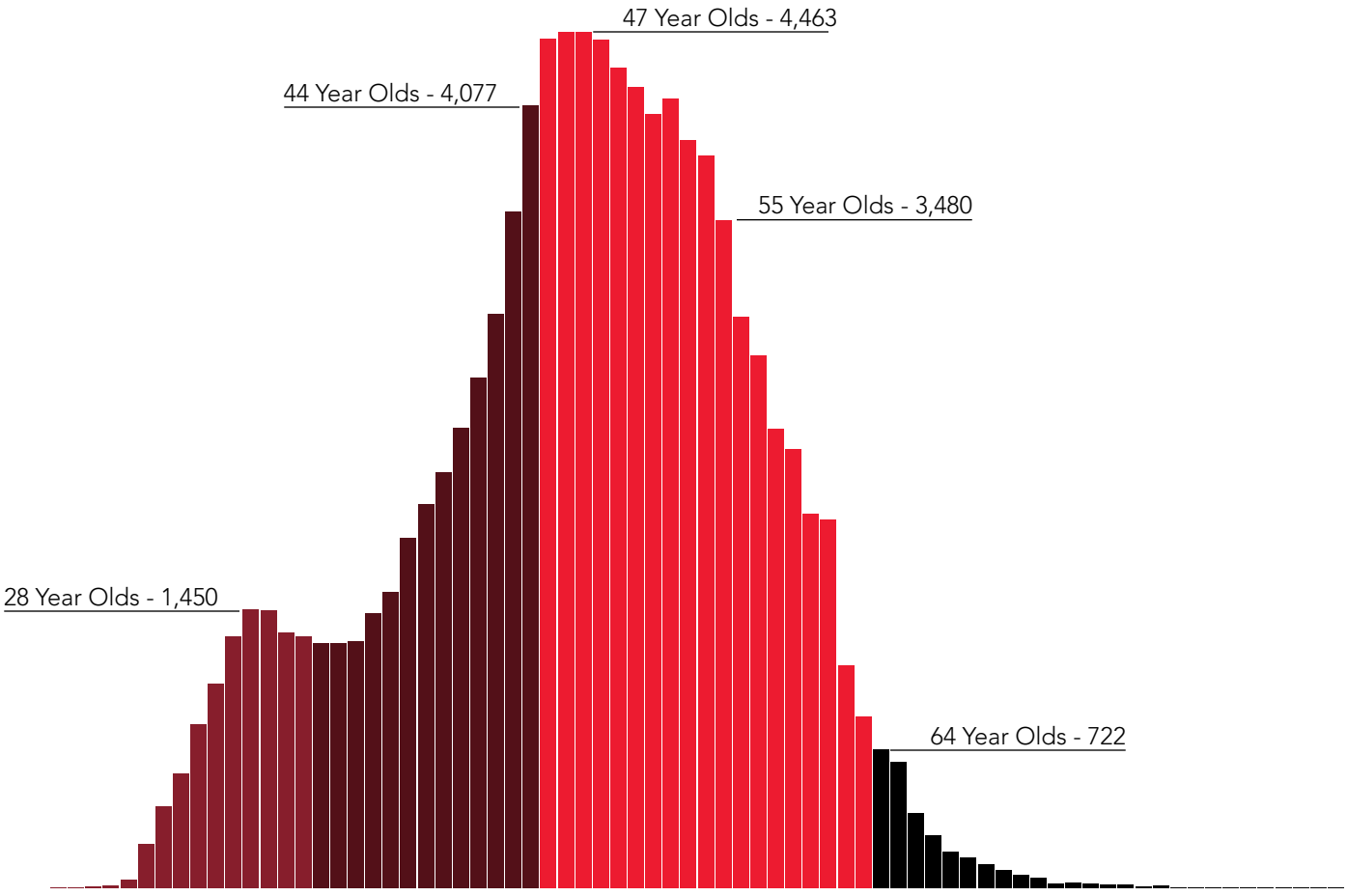


Figure 2.1 FY2008 Geographic Distribution of the Major Federal IT Population

The younger generations, Generation X and the Net Generation, range from 17 to 44 in age in the federal IT workforce. This entire age range is significantly under-represented in government when compared against the Boomer population. Generation X, as a group, has been less inclined to public service careers. Additionally, the 1990s, the period when many Gen X typically might have entered public service, was a decade of large-scale downsizing within the Federal Government. Almost 400,000 individuals were culled from the civil service ranks, largely through a combination of attrition, incentives for early retirement, and hiring freezes. The Net Generation (or "Net-Gen"), so-named due to their deep immersion with technology and use of the Internet, is the youngest generation in the workforce. Their representation in the federal IT workforce is influenced by their specific occupations and the current grade structure, and also may be adversely affected by the challenges associated with attracting and recruiting them to federal service.



Source: OPM
September 2008
103,322 personnel

Figure 2.2 FY2008 Generational Distribution of the Major Federal IT Population

2210 COMMUNITY

The 2210 series is a fairly new occupational series, established in 2001, and largely populated through a multi-year migration of individuals from the former Computer Specialist (0334) series which was not completed until FY2006. Within the 2210 community are several specialty areas: Applications Software, Customer Support, Data Management, Enterprise Architecture, Information Security, Internet, IT Project Management, Network Services, Operating Systems, Policy and Planning, Systems Administration, and Systems Analysis. A breakdown by specialty area is not available from federal databases, however, separate surveys of federal IT personnel, the IT Workforce Capability Assessment, conducted in 2004 and 2006, did provide data for the 2210 specialty areas and eight additional areas of interest such as Records Management and Privacy (see www.cio.gov). Within the IT Management community reside three federally-designated mission critical occupations: Enterprise Architecture, IT Project Management, and Information Security.

IT Specialists are employed by all Cabinet-level agencies and large independent agencies, as well as most medium independent agencies. From FY1997–FY2008, and as the community evolved from Computer Specialists to IT Specialists, there was a 24% growth in this sector of the IT workforce, with most agencies gradually increasing their number of 2210 series employees. At the end of FY2008, there were 68,626 individuals in this community as shown in Figure 2.3.

Seventy-five percent of the 2210 community was under the General Schedule (GS) or a related pay plan in FY2007, with a median pay grade of GS-12. The community has grown its number of senior grade managers over time, as the scope of IT Management duties has become more complex (see Figure 2.4). Additionally, the average age of workers has increased. The end result is a large, retirement-eligible population which is impacting most grade levels.

New hires typically make up the majority of annual 2210 accessions, with agency transfers ranging between 12%–16% during FY2004–FY2008 (Figure 2.5). The age range of hires has skewed older, with annual hiring (Figure 2.6) contributing significantly to the generational imbalance within the 2210 series.

The Net Generation has the highest turnover rate within the 2210 community. FY2008 turnover for Net-Gen employees within the 2210 community was 9%, with 271 individuals leaving federal service; an additional 65 employees transferred to other agencies, creating a total "churn" of 11.1% amongst the Net-Geners. Generation X employees were the most stable, with a

Figure 2.3 2210 Community: Fiscal Year End Strength

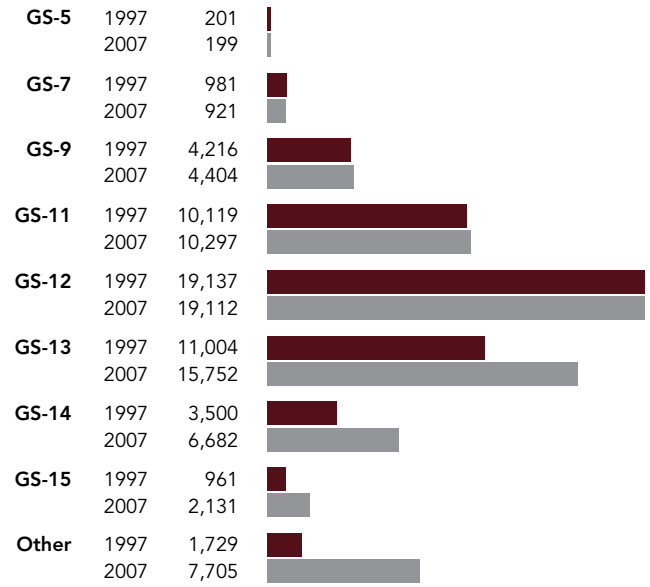


Figure 2.4 2210 Community: Grade Distribution Comparison of General Schedule and Related Grade Workforce

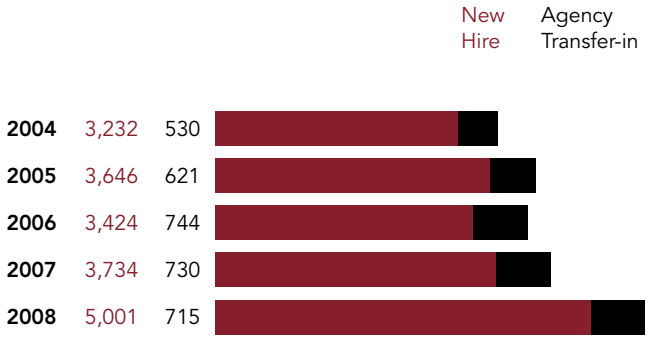


Figure 2.5 2210 Community: Fiscal Year Accessions

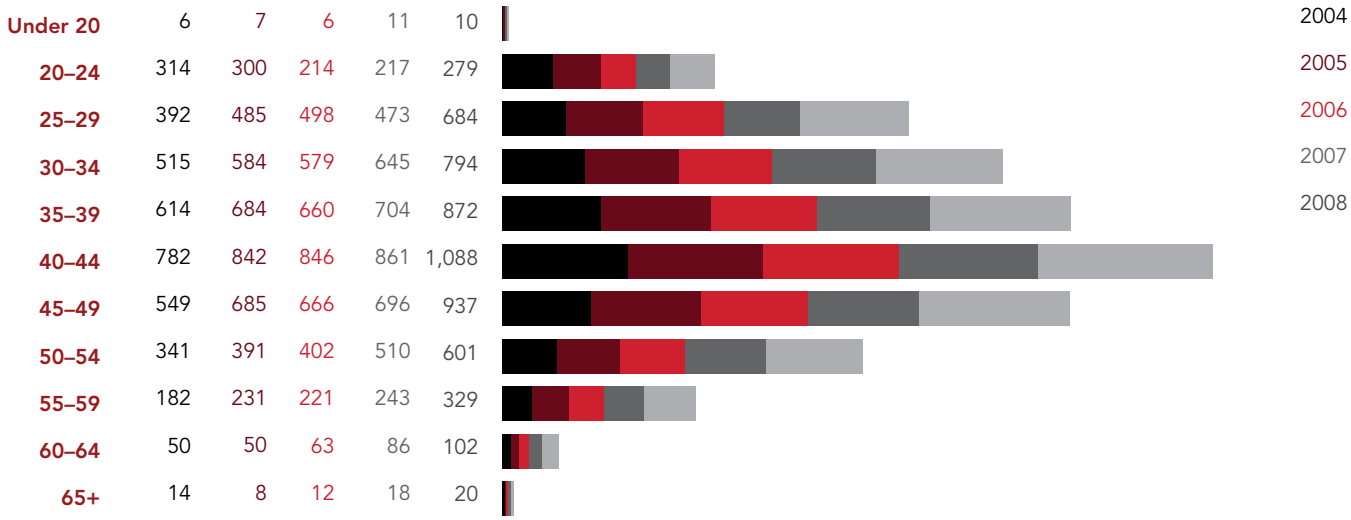


Figure 2.6 2210 Community: Fiscal Year Accessions by Age Group

3.2% turnover rate. Overall series turnover was 7% for FY2008.

Retirements form the bulk of annual losses from the 2210 community, followed by individuals quitting federal service (Figure 2.7). In general, IT Management personnel quitting federal service or transferring within the Federal Government have been rising as a percentage of overall separations, while retirements have declined in recent years. In part, the reason for the decline in retirements can be attributed to fewer early retirees from this community. The number of early retirements in a community is directly influenced by the availability of this retirement authority which is controlled by the Office of Personnel Management (OPM) and agency policy. When agencies "turn on the spigot" of the early retirement authority, total retirements typically increase in the short term as more people retire before their normal eligibility date. Since FY2003, early retirements have declined from 24%–10% of all retirements, thus influencing the total number of retirements. Another, and more recent factor influencing retirement losses, has been the downturn in the economy. The average length of service for voluntary retirees has remained steady at 31 years of service (see Appendix B for additional information on separations and turnover rates for the 2210 community).

Forty-nine percent of FY2008 retirements came from the GS-9 to GS-12/related pay scale (Figure 2.8), indicating excellent opportunities for hiring and advancement within the mid-grade levels. With structured workforce planning, agencies can create targeted internship programs or laddered hiring opportunities through which they can groom and grow a more generationally-balanced workforce. This will take time

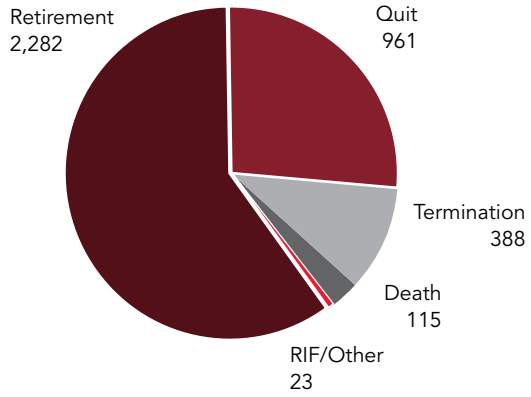


Figure 2.7 2210 Community: FY2008 Separations from Federal Service

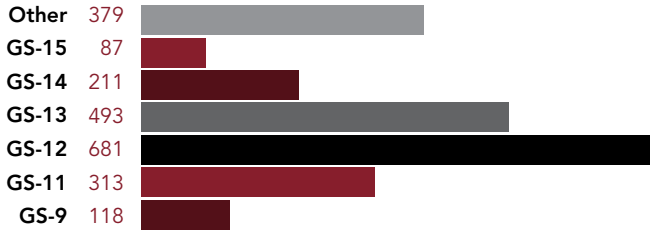


Figure 2.8 2210 Community: FY2008 Retirement Losses from General Schedule and Related Grade Workforce

since the Net Generation comprised less than 5% of the 2210 community in FY2008. Without targeted hiring, it will be difficult to strategically grow this segment of the population. Some agencies do have programs which groom younger individuals and, as Figure 2.9 demonstrates, there is a small percentage of Net-Geners who have already advanced as high as GS-12/13.

In spite of the size of the IT Management community, and its designation as a critical community, few individuals were targeted with funded recruitment and retention tools within this community in 2007. Less than 3% of new 2210 hires (108 of 3,734 individuals) received a recruitment bonus; 52 personnel received relocation bonuses; and 831 received retention bonuses. Additionally, 218 FY2007 recipients and 156 Calender Year (CY) 2008 recipients received student loan repayment benefits (which were either new or recurring awards).

Women comprised 36% of the 2210 community in FY2008, whereas they were 39% of the 0334 series in FY1997. FY2008 hiring and loss patterns provide a good demonstration for why female representation in this community has decreased. While women were 35% of the 2210 community's separations from federal service in FY2008, they were only 24% of new hires, contributing to a net loss of 745 women over the past two years. Within the community, women's representativeness increases generationally, peaking at 39% of the Baby Boomer IT Specialists. With the small percentage of Net-Geners in this community, this means that Net-Gen women will have fewer female peers, but a larger potential community of more senior female mentors.

Minorities made up 31% of federal IT Specialists in FY2008 (Figure 2.10), with African-Americans comprising 18% of the community, Asians 7%, and Hispanic/Latinos 4%. Other racial/ethnic groups made up the remaining two percent. When compared with the majority/white population, Asians had greater representation at GS-13/14, while Hispanics had greater representation at GS-11 and less representation at GS-13/14. Given that this community typically hires at all age/grade levels, there is opportunity to increase representativeness through both hiring and professional development programs.

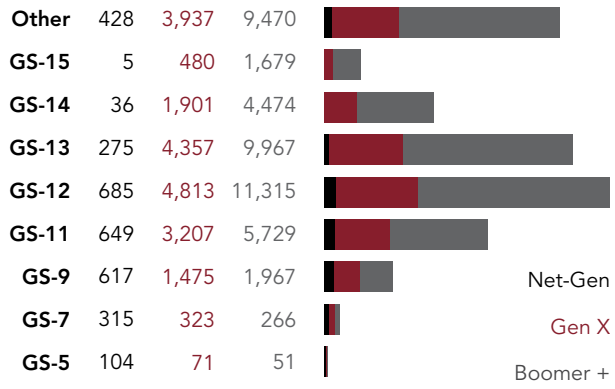


Figure 2.9 2210 Community: FY2008 Generations by Pay Grade

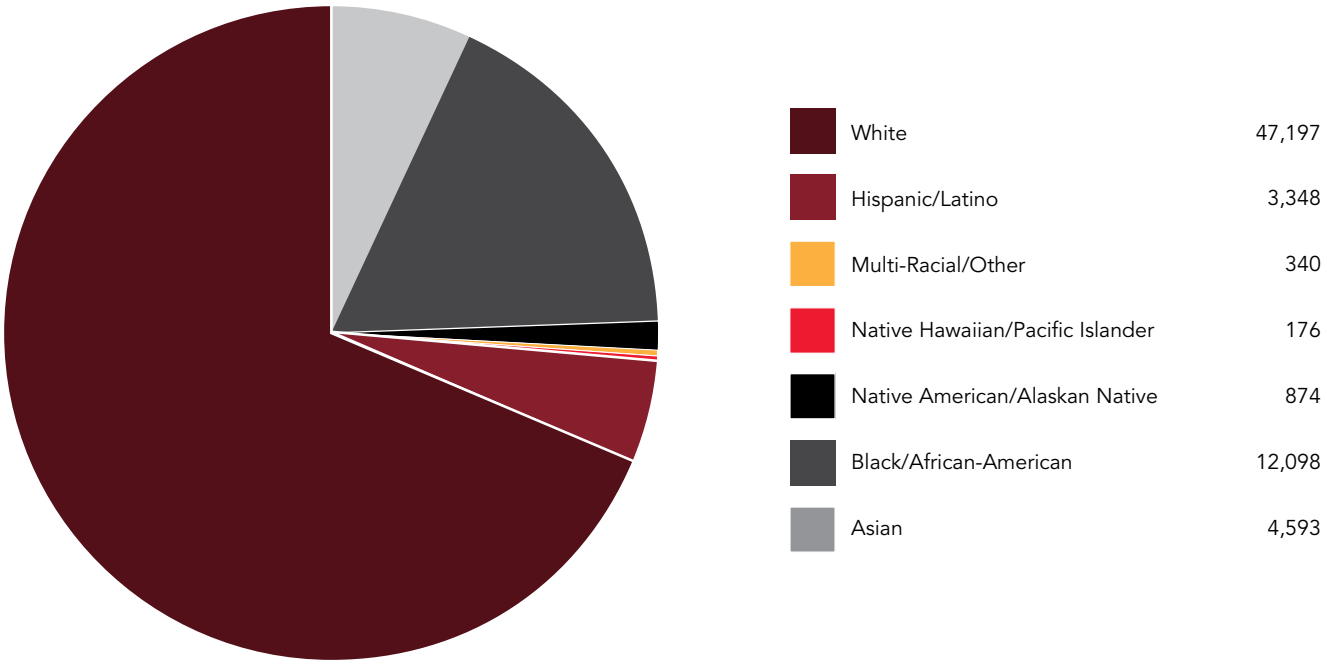


Figure 2.10 2210 Community: FY2008 Race/Ethnicity

1550 COMMUNITY

The 1550 series (Figure 2.11), is one of the smaller communities within the Major Federal IT Community. This community has experienced significant growth over the past decade, increasing over two thirds in size since FY1997. Even as the overall growth continues, some organizations have decreased their number of Computer Scientists, most notably, the Department of Commerce (whose 1550 population declined 32% in FY2007). The 1550 series had 5,404 employees at the end of FY2008.

One or more Computer Scientists are employed by most Cabinet-level agencies, with the exception of the Department of Labor (DOL) and the Department of Housing and Urban Development (HUD). Few other organizations, outside of the National Aeronautics and Space Administration (NASA) and the Departments of Commerce, Transportation, and Health and Human Services (HHS), employ significant numbers; the Department of Defense (DoD) employs over 80% of all federal Computer Scientists.

Seventy percent of the community was part of the General Schedule or a related pay plan in FY2008. Within this segment of the population, there has been growth in the senior pay grades over time, as shown in Figure 2.12. Further examination of those in alternative pay plans might yield additional information on overall pay structure and seniority. The median pay grade within the GS/Related Schedule community is GS-13.

This community is more youthful than their IT Management counterparts, with their Net-Gen (17%) and Gen X (34%) personnel comprising over half of their total population. Hiring patterns (Figure 2.13)

Figure 2.11 1550 Community: Fiscal Year End Strength

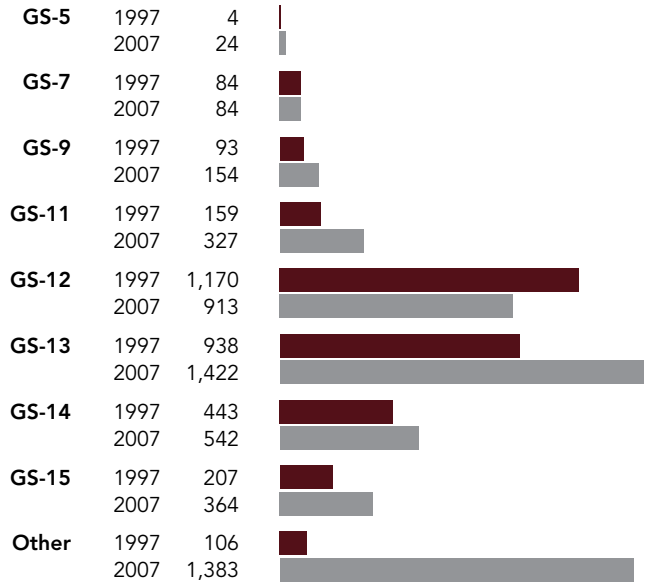


Figure 2.12 1550 Community: Grade Distribution Comparison of General Schedule and Related Grade Workforce

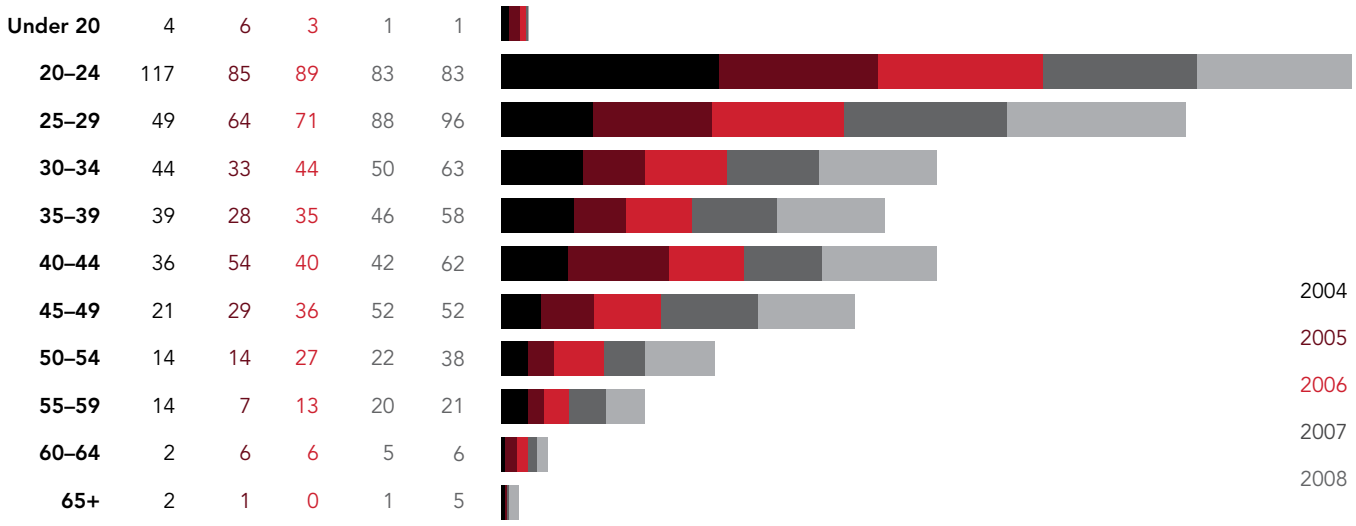


Figure 2.13 1550 Community: Fiscal Year Accessions by Age Group

contribute to the more youth-oriented community. Additionally, the 1550 series has positive education requirements requiring at least a bachelor's degree for all hires. Seventeen percent of new hires received a recruitment bonus in 2007, while 22 individuals received federal student loan repayment program benefits in FY2007 and 16 received them in CY2008. Figure 2.14 provides a five-year pattern of accessions; annual accessions have risen the past three years, while losses have fluctuated (Appendix B). Total community personnel strength continued to rise in FY2008.

As with the 2210 Community, turnover is highest among the Net Generation age group. After spiking to 11.3% in 2006, Net-Gen turnover dropped to less than 8% in both FY2007 and FY2008. Overall, there is less turnover among the Computer Scientists than the IT Specialists, however, both Net-Gen and Gen X Computer Scientists who leave their agencies are significantly more likely to quit federal service than transfer to another job within the Federal Government (Figure 2.15). This could be an area for further exploration by agencies to determine why these individuals are leaving federal service; depending on their reasons, these younger Computer Scientists could be a better fit at another agency and might be interested in staying within the Government. Additional turnover and separations data are included in Appendix B.

As a result of a different generational pattern, retirements from the Computer Science community are less than a third of all separations (Figure 2.16). Additionally, early retirements have played less of a role in total retirement losses and have been on a decline. Over the past six years, voluntary retirements have risen from 82%–87% of all retirements and these retirees had had an average length of service of 29 years in FY2008. Thirty percent of FY2008 retirements were from individuals in alternate pay plans, followed by GS-13s (24%), GS-15s (16%), GS-12s (15%), and GS-14s (13%).

Currently, women comprise 28% of federal Computer Scientists, down from 31% in FY1997. Generationally, female representation peaks within Generation X, where women comprise 30% of Gen-Xers. The ability to improve female representativeness will be challenging, given the lower numbers of women who enter this career field. In FY2008, women were 24% of separations from federal service and 22% of new hires, resulting in a net gain of 39 women. Of note, on average, starting salaries for new Computer Scientists within the Federal Government were higher for women, an indication that agencies may be trying to positively influence their representation.

Racial/ethnic minorities comprise 26% of all federal Computer Scientists, with the Asian community representing over half of the minority population (Figure

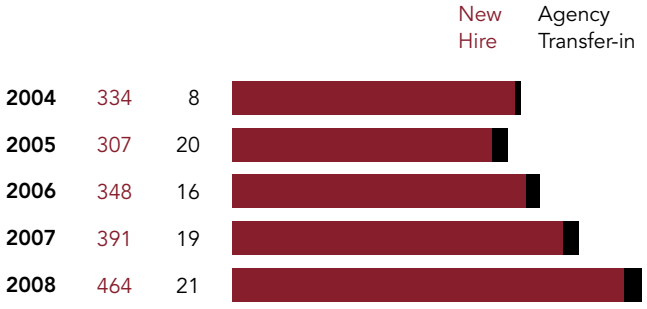


Figure 2.14 1550 Community: Fiscal Year Accessions

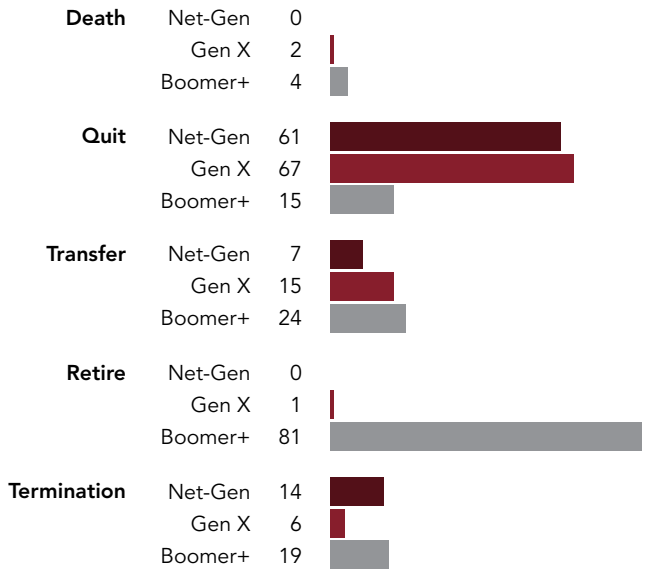


Figure 2.15 1550 Community: FY2008 Separations by Generation

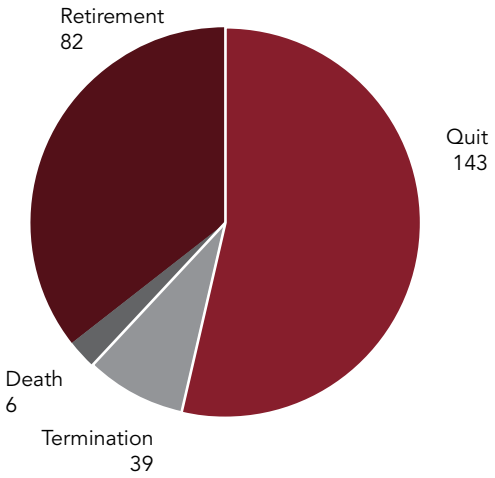


Figure 2.16 1550 Community: FY2008 Separations from Federal Service

2.17). African-Americans account for 8% of Computer Scientists and Hispanics/Latinos, for another 3%. Other racial/ethnic groups totaled less than 1%. Within the General Schedule/Related Schedule, African-Americans, Asians, and Hispanic/Latinos have greater representation at GS-12 and less representation at GS-13 to GS-15. However, it should be noted that Hispanic/Latinos and Asians have a greater percentage of their population in alternative pay plans, as shown in Appendix C. More in-depth study would be required to determine overall representativeness across the 1550 series.

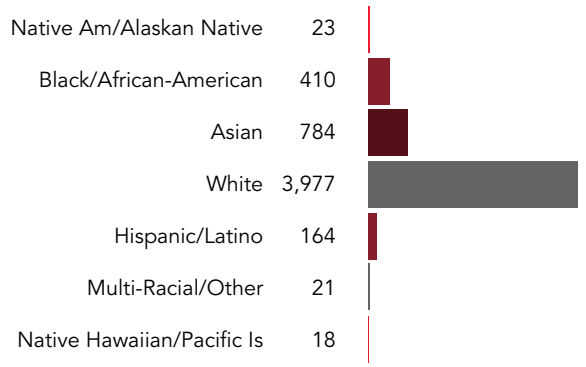


Figure 2.17 1550 Community: FY2008 Race/Ethnicity

0855 COMMUNITY

The Electronics Engineering community, the 0855 series, is the second largest segment of the federal IT workforce, ending FY2008 with 19,302 individuals (Figure 2.18). The DoD employs 85% of federal Electronics Engineers; other federal organizations with large populations include Transportation, NASA, Commerce and the Federal Communications Commission. While most Cabinet-level organizations employ one or more Electronics Engineers, many have decreased their number of these employees. During FY1997–FY2008, the size of the federal-wide community decreased 18%, with the U.S. Department of State implementing the largest internal reduction in federal Electronics Engineers (from over 200 individuals to less than 10 over four years' time). In FY2008, one organization, the Nuclear Regulatory Commission, more than doubled its 0855 population, growing from 9 to 23 employees.

Figure 2.18 0855 Community: Personnel Strength by Fiscal Year

About one third of the Electronics Engineering community is in alternative pay plans. This is a significant shift that occurred during the last 10 years, as shown in Figure 2.19. Positions graded at the GS-12 and 13 levels have both declined, most likely as a result of this migration to alternative pay plans, the re-grading of positions, and the community's decline in personnel strength. Interestingly, this series is the only occupation in the Major Federal IT Community where the average salary of those in other pay plans is lower than the average salary of individuals paid under the General Schedule. It is unclear if locality pay or special salary rates are influencing this, or if the seniority/pay levels of those in other pay plans are lower, but further investigation may be warranted. The median grade of GS/Related Schedule employees is GS-13.

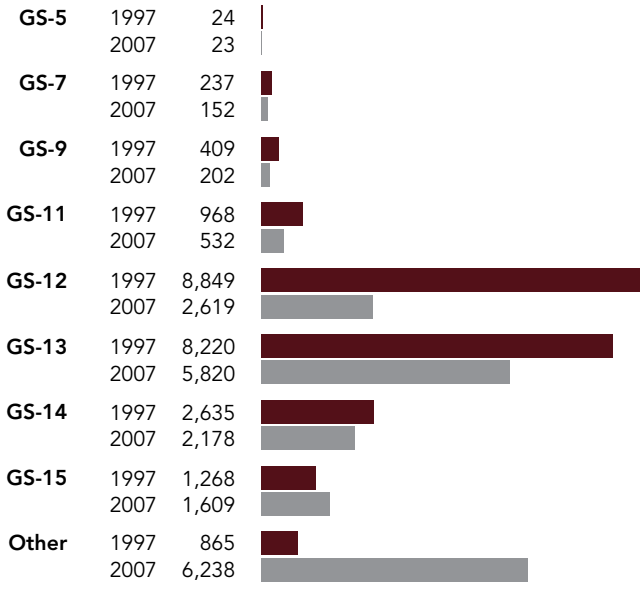


Figure 2.19 0855 Community: Grade Distribution Comparison of General Schedule and Related Workforce

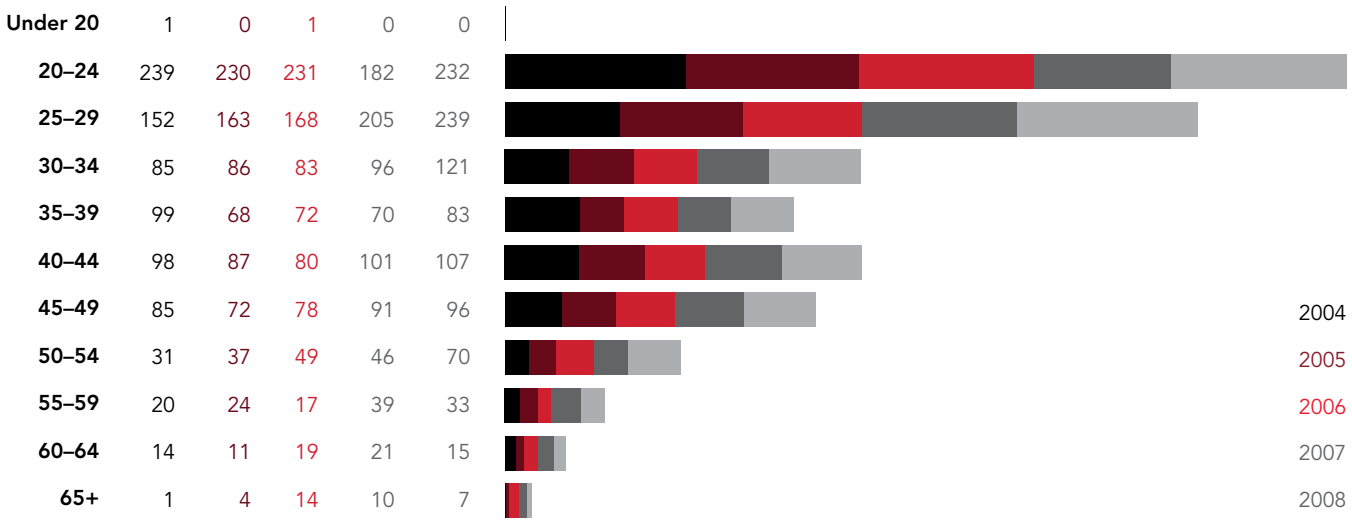


Figure 2.20 0855 Community: Fiscal Year Accessions by Age Group

The Electronics Engineering community draws the largest segment of its accessions from recent college graduates which influences generational hiring patterns, as shown in Figure 2.20. Significant challenges exist in recruiting to this community as 321, or 42% of new hires, received a recruitment bonus in FY2007. Accessions have been increasing (Figure 2.21) as the community's downsizing levels out.

Unlike the Computer Science community, retirements form the major losses from this community (Figure 2.22). Individuals in other pay plans comprise 33% of voluntary retirements, followed by GS-13 individuals (29%) and GS-15s (17%). The next largest source of losses is from Net Generation and Generation X employees who quit federal service (Figure 2.23). Net-Geners are over four times more likely to quit than to transfer to another job, a behavior worth further study.

Overall, Electronics Engineering turnover has been fairly stable across the generations, with losses from federal service changing from a downward trend, to slightly increasing in FY2008 as shown in Appendix B. Net Generation representation within the community has grown from 10%–12% over the past five years, demonstrating some positive momentum and, together, the Net-Gen and Gen X comprised 42% of the Electronics Engineering Community in FY2008.

Loss rates are being positively influenced by aggressive management tactics. In 2007, 2,314 Electronics Engineers received retention bonuses, comprising 10% of all federal recipients, and making them the top series targeted with retention bonuses within the Federal Government that year. Twenty-six individuals also received relocation bonuses in 2007. Federal student

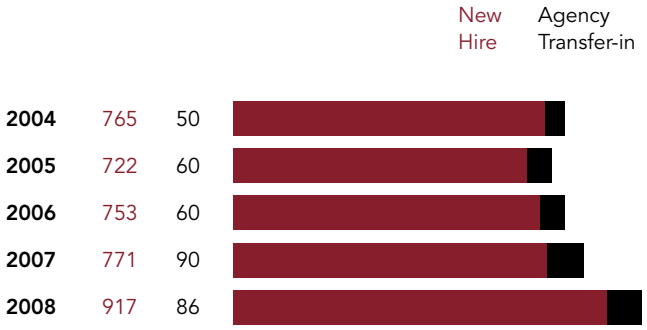


Figure 2.21 0855 Community: Fiscal Year Accessions

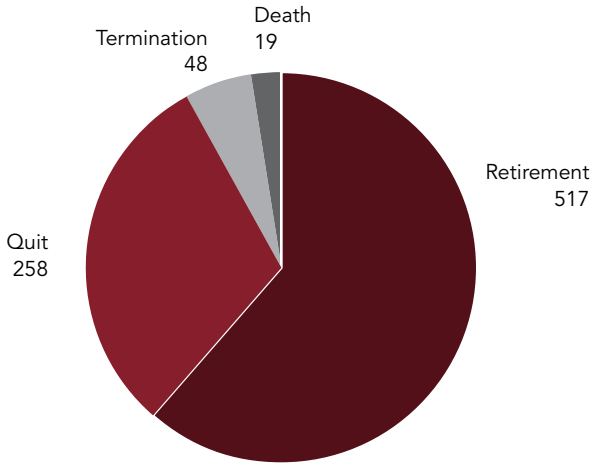


Figure 2.22 0855 Community: FY2008 Separations from Federal Service

program loan repayment participation dropped in this community, with 93 recipients in FY2007 versus 61 in CY2008.

Women currently comprise 10% of the 0855 community, up from 8% in FY1997. This is the only occupation examined that has seen growth in the number of women within the community, although they still have the lowest female representation among the five series. Additionally, of the five series within the Major Federal IT Community, Electronics Engineering has the lowest female representation among the older generations. Only 7% of federal Baby Boomer Electronic Engineers are women vice 16% representation in the Net Generation, as shown in Appendix C. This may have a negative impact on women pursuing a federal career in engineering as there are fewer senior female role models. In FY2008, women were 7% of losses from the community and 13% of new hires, for a net gain of 15 women engineers.

Racial/ethnic minorities make up 28% of this community. Asians comprise 16% of engineers, African-Americans and Hispanic/Latinos each make up about 5.6% and other ethnicities total the remaining 1%, as shown in Figure 2.24. Within the General Schedule, Asians, African-Americans and Hispanic/Latinos are less represented at GS-13 through GS-15 when compared against the White population in these pay grades. However, it must be noted that a larger percentage Hispanic/Latino and Asian Electronics Engineers (35% each) are in alternate pay plans versus White engineers (28%). Thus, further examination on representation would be warranted. Twenty-nine percent of African-Americans are also in alternative pay plans.

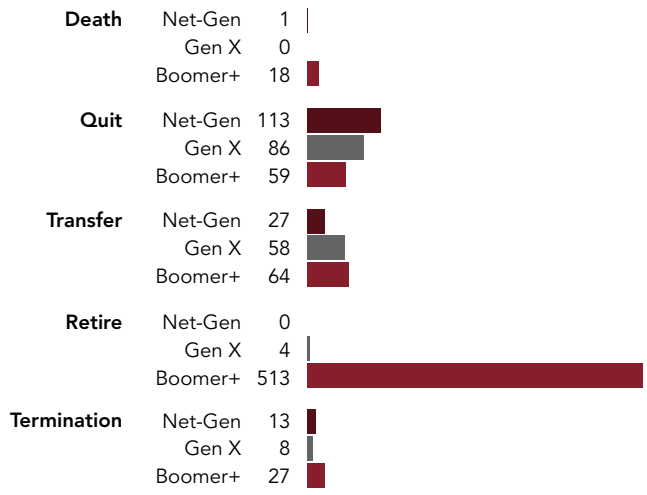


Figure 2.23 0855 Community: FY2008 Separations by Generation

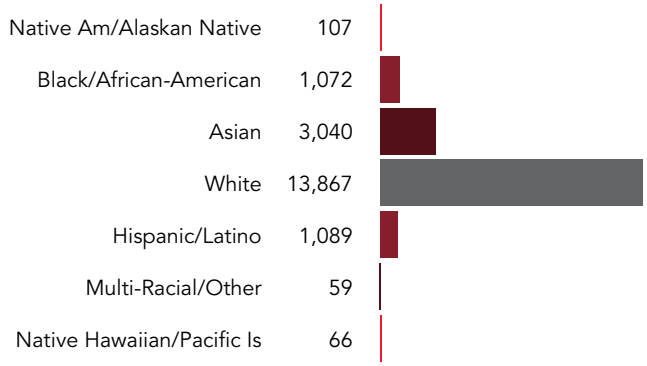


Figure 2.24 0855 Community: FY2008 Race/Ethnicity

Electronics Engineers traditionally have been considered part of the Science and Engineering community in government. With the expansion of IT and integration of technologies, many engineers may now be performing work considered to be part of the information technology domain, some of which is already captured in the 0854, or Computer Engineering series. For 2008, the U.S. Department of Labor's Bureau of Labor Statistics calculated that one third of Electronics Engineers were employed as Computer Hardware Engineers.[2] As the Federal Government progresses in its effort to become a competency-based workforce, personnel surveys and job analyses may be able to shed further light on the interplay between the disciplines and how their IT-related work may be best described.

0854 COMMUNITY

As with the Computer Scientists, the Computer Engineering community, the 0854 series, has also experienced significant growth, increasing over 70% between FY1997–FY2007. The community continues to grow, ending FY2008 with 4,203 personnel in the federal population (Figure 2.25). The DoD and NASA employ almost 95% of the federal Computer Engineering community, although most Cabinet-level agencies do employ one or more Computer Engineers. The Department of the Treasury, the Department of Transportation and DoD have all experienced steady growth in their Computer Engineering population, while NASA has decreased its number of Computer Engineers by 12% since FY2004.

The 0854 series is the most youth-oriented of the five series within the Major Federal IT Population. Together, Net Generation (21%) and Generation X (33%) individuals form the majority of the community, with Baby Boomers and beyond accounting for 46% of the total population. The growth in the Computer Engineering community has been at every grade level, most notably at GS-12/13, as shown in Figure 2.26. Net-Geners have excellent opportunity for advancement within this community, outnumbering the other generations in every grade at GS-11 or below, and with almost identical numbers as Gen X at GS-12 (303 Gen X versus 300 Net-Geners).

This is a community that bears watching over the next few years. While this small community has the lowest turnover rate among the five communities, there has been some internal volatility that may be masked by overall community growth. With a larger Net-Gen population, typically comes a larger quit rate, as seen in other communities. Net Generation turnover was on a rising trend, but stabalized in FY2008 (Appendix B). As an example, Net-Gen quit numbers exceeded Baby Boomer retirements in FY2007, but then dropped below them in FY2008 (Figure 2.27).

Accession patterns have also been more volatile in this community. Federal Computer Engineers, like their Electronics Engineer counterparts, have a positive degree requirement, and a similar youth-oriented hiring pattern, indicating hiring targeted to recent college graduates (Figure 2.28). In FY2004, there was a 30% spike in Net-Gen accessions (Figure 2.29). If recruitment incentives were used for this particularly large cohort, their payback period may have recently ended, making them potentially more susceptible to outside job offers. At the other end of the generational spectrum, retirements jumped 44% between FY2004 and FY2005, and continue to fluctuate, as do transfers. Overall, the use of recruitment and retirement incen-

Figure 2.25 0854 Community: Fiscal Year End Strength

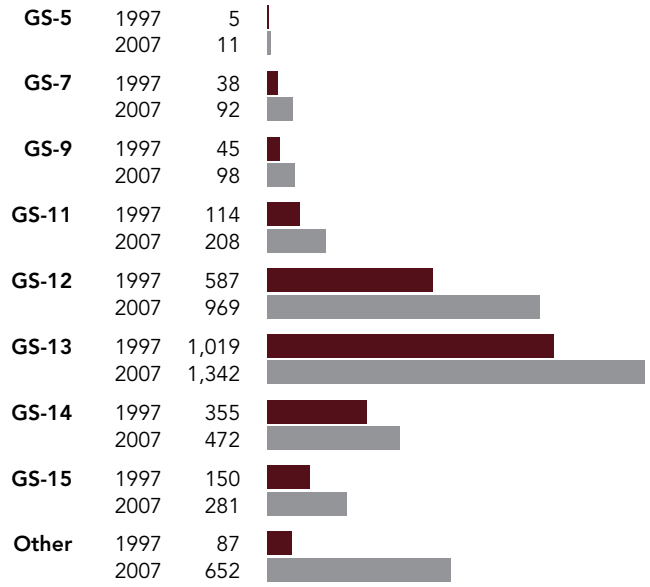


Figure 2.26 0854 Community: Grade Distribution Comparison of General Schedule and Related Grade Workforce

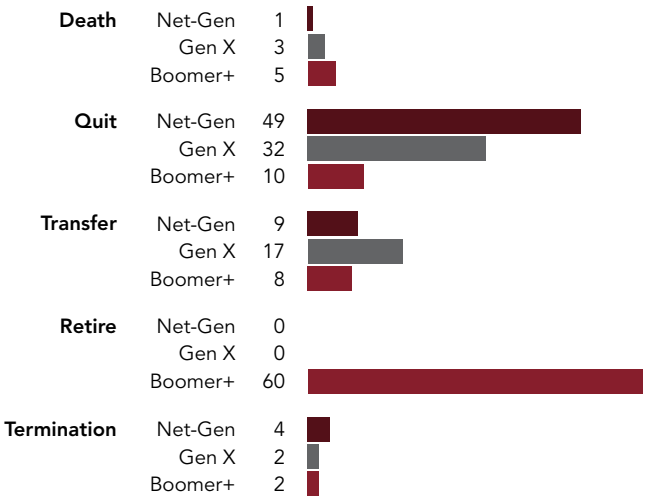


Figure 2.27 0854 Community: FY2008 Separations by Generation

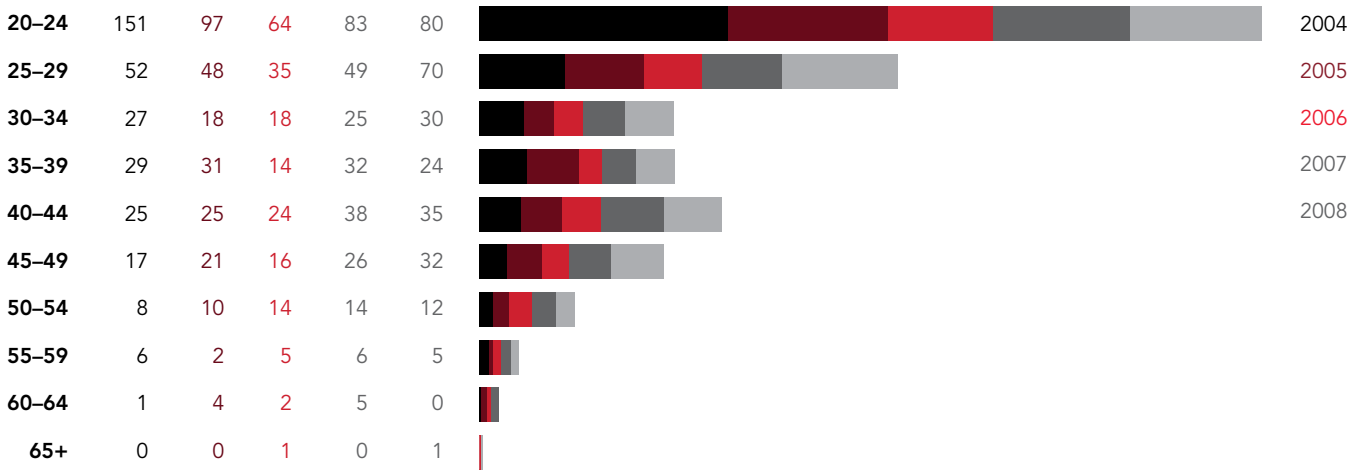


Figure 2.28 0854 Community: Fiscal Year Accessions by Age Group

tives currently does not indicate a significant problem in personnel strength. Only 18% of new hires received a recruitment bonus in 2007 and 32 individuals participated in the federal student loan repayment program. Federal-wide, 5 Computer Engineers received relocation bonuses and 35 received retention bonuses. However, given the large number of Net-Geners at the GS-12 level (and a small number at GS-13), more rapid advancement opportunities may be being utilized as an incentive. Personnel strength in this community continued to rise in FY2009.

In FY2008, women comprised 18% of this community, showing a small decrease since FY1997. The Computer Engineering community currently has the smallest percentage of female Net-Geners across the Major Federal IT Population. Within the General Schedule, women are under-represented percentage-wise when compared to their male counterparts, at GS-12 through GS-14, and over-represented at GS-9 through GS-11.

Racial/Ethnic minorities made up 31% of the Computer Engineering community in FY2008 (Figure 2.30) and Computer Engineers may be considered the most balanced community in its White/African-American representation across pay grades when compared to the other Major Federal IT Series. Although Hispanic/Latinos and Asians are less represented from GS-13 through GS-15, they have higher population percentages at GS-12, creating opportunity for advancement. See Appendix C for additional data.

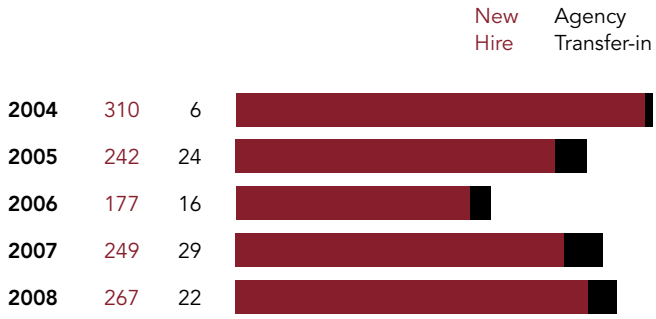


Figure 2.29 0854 Community: Fiscal Year End Strength

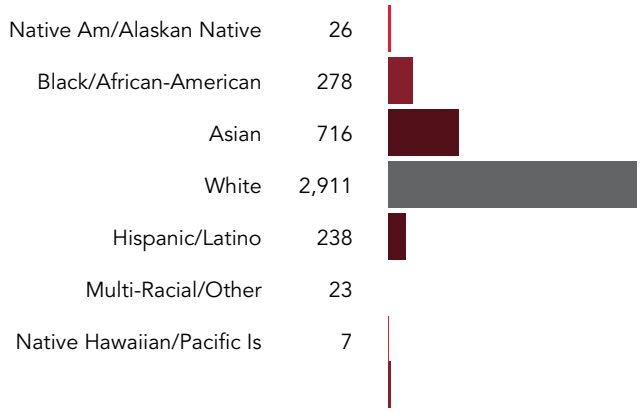


Figure 2.30 0854 Community: FY2008 Race/Ethnicity

0391 COMMUNITY

Changing technologies and the integration of capabilities and systems transmitting electronic information, have changed the role of the Telecommunications community, the 0391 series (Figure 2.31), over the past several years. This community also experienced an 18% decrease in personnel between FY1997 to FY2007 as telecommunications functions were outsourced or streamlined. Although all of the Cabinet-level agencies employ Telecommunications Specialists, most have decreased their number of employees. The reductions in overall personnel strength have been taken at every grade level, as shown in Figure 2.32.

Within the Federal Government, only HHS has experienced significant personnel growth, more than tripling the size of their 0391 community between FY2006–FY2008 (growing from 116 to 367 personnel, mostly through a large transfer into the agency). There were 5,787 personnel in the 0391 series across the Federal Government at the end of FY2008, reversing a previous four-year pattern of declining personnel strength. The Department of Defense, the Department of Justice and the Department of Homeland Security employ the largest numbers of Telecommunications Specialists.

The Baby Boomers dominate this community, with 70% of the overall population, and typically, retirements have accounted for over half of annual separations. Retirements are impacting every grade level in this community, most notably at the GS-12/13 levels. Hiring patterns greatly influence the generational representation, with many replacement accessions coming from the Boomer population, as shown in Figure 2.34. Currently Net-Geners comprise only 3% of the 0391 community. Given the current federal hiring trends, and the fact that Net-Gen Telecommunications Specialists have the highest turnover rate (24%) within the Major Federal IT Population, it is unlikely that their representation will grow significantly in this community without deliberate management intervention.

Overall, the 0391 series has the highest turnover rates (Appendix B) within the Major Federal IT Population, which include the highest retirement and termination rates. Figure 2.35 displays the distribution of FY2008 separations. Limited incentives were used for this community in 2007: 7 individuals received recruiting bonuses; 8 received student loan repayment benefits and 1 employee was given a relocation bonus. More funds were directed at retaining people, with 83 individuals receiving a retention bonus. Another five individuals received student loan repayment program benefits in CY2008.

Figure 2.31 0391 Community: Personnel Strength by Fiscal year

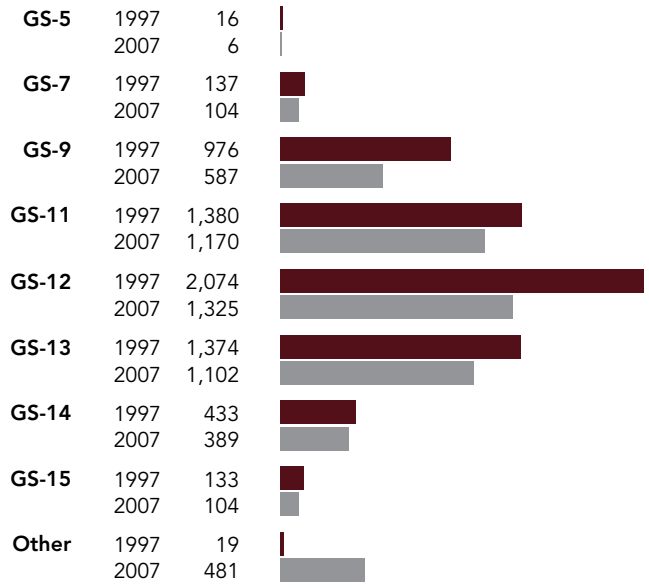


Figure 2.32 0391 Community: Grade Distribution Comparison of General Schedule and Related Grade Workforce

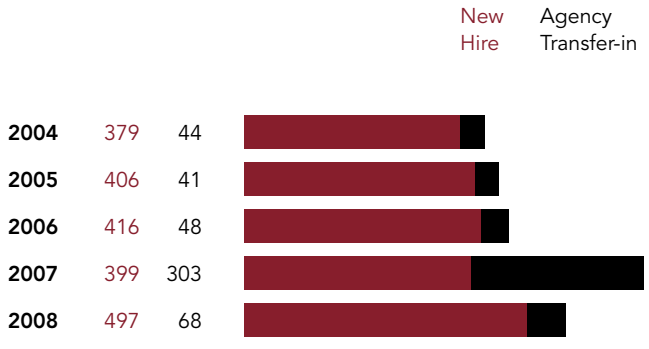


Figure 2.33 0391 Community: Fiscal Year Accessions

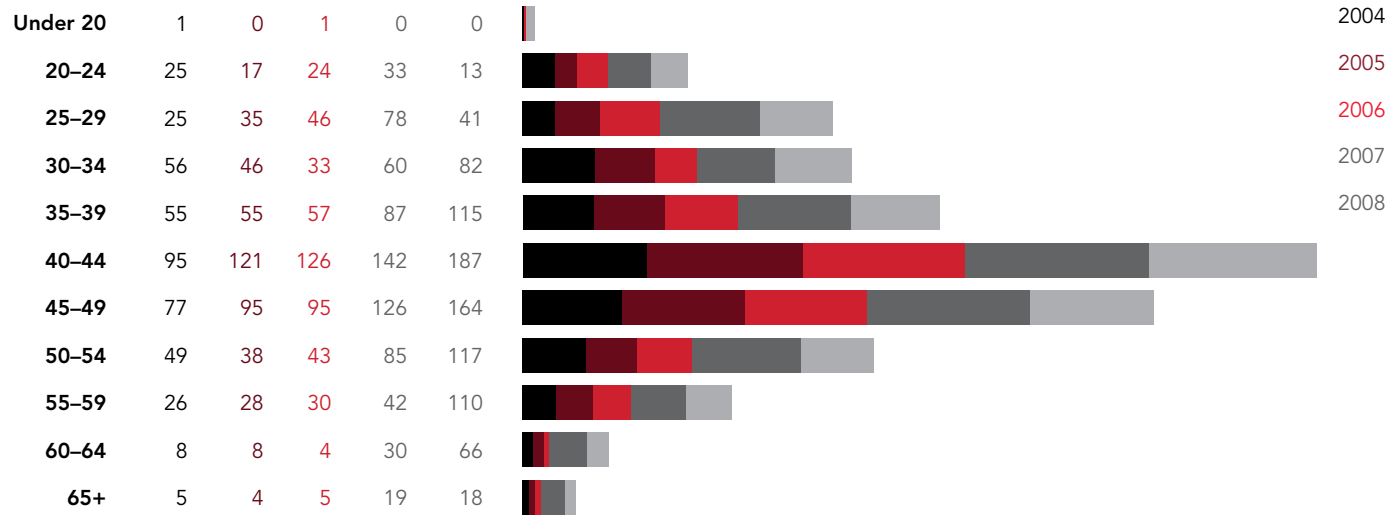


Figure 2.34 0391 Community: Grade Distribution Comparison of General Schedule and Related Grade Workforce

The telecommunications field has been transitioning in private industry as well as within the Federal Government. This community bears more examination to determine whether additional personnel management action is necessary.

Women comprised 25% of this community in FY1997 and 20% in FY2008, with greater representation at GS-11 and below. The Telecommunications community has the largest minority population, percentage-wise, of the Major Federal IT Population; 40% of its individuals are from a racial/ethnic minority (Figure 2.36). African-Americans are well-represented through GS-13, while Hispanic/Latinos and Asians are well-represented through GS-12. All three racial/ethnic groups are less-represented at GS-14/15.

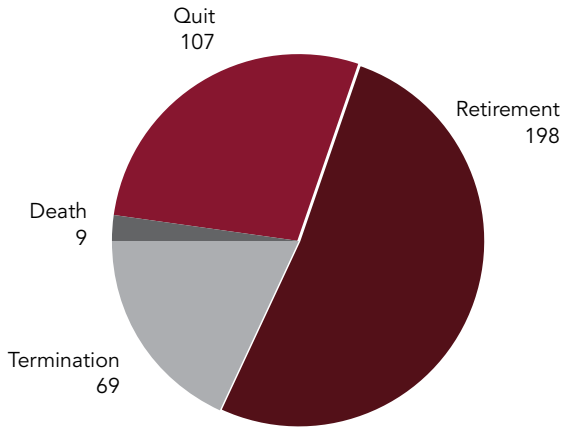


Figure 2.35 0391 Community: FY2008 Separations from Federal Service

FY2009 UPDATE

The Major Federal IT Community grew by almost 5,000 people in FY2009, ending the year at 108,260. All five series included in this population saw in increase in strength, with new hires increasing and federal separations significantly decreasing. Eighty percent of the Federal CIO Council membership increased their IT Management (2210 series) personnel strength. The Department of Homeland Security had the largest increase, growing 13%, while DoD and the Department of Justice's 2210 populations grew 8% and 7%, respectively. Appendix H contains a synopsis of key FY2009 statistics.

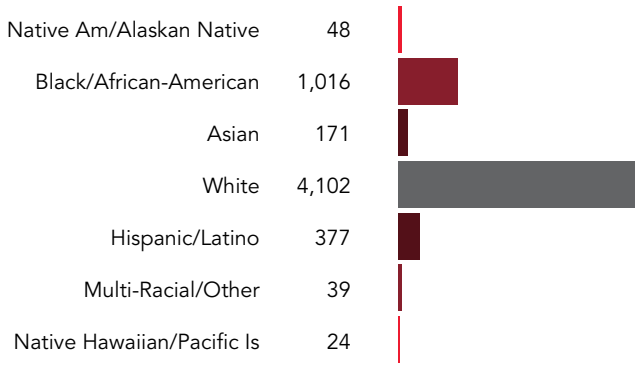


Figure 2.36 0391 Community: FY2008 Race/Ethnicity

forecast of future labor supply and demand

Over the next several years, the Federal Government will experience the largest unplanned exodus of middle and senior management talent in the history of our nation as significant numbers of older workers currently in federal service become retirement-eligible. It is not known whether these departures will be as cataclysmic as a tsunami, or will instead ebb and flow over a greater number of years as the Baby Boomer generation times their retirements to meet individual life choices. Nor is it fully understood yet how the recent economic turmoil will impact federal retirements. No matter what the scenario, eventually the need to replace outgoing expertise, and also to fill newly created jobs, will result in a significant demand for talent within the labor market. This chapter provides a discussion of several labor force trends and their potential impact on IT workforce management.

MAKING SENSE OF FEDERAL RETIREMENT PROJECTIONS

Federal workforce retirement behavior is influenced by a variety of individual and environmental factors. The first is individual retirement eligibility, which is based on the type of retirement system, age of the employee, length of service and minimum retirement age. Retirement decisions are further dependent on how individuals prioritize work, based on several factors that could include hours spent at work, desire for variety, financial needs, willingness to learn, and level of acceptable responsibility.[1] Additionally, advancements in technology significantly influence individual career decisions of personnel in IT-related career fields who may be either positively or negatively impacted by changing technology.

External environment influencers include the state of the economy and labor market demands, neither of which can be controlled by the employee. Finally, the traditional retirement model of employees ending their career after reaching their peak status is gradually shifting to new models of retirement. The interplay of all of these changeable conditions creates challenges in modeling predictive retirement behavior. The following retirement statistics (calculated prior to the recent economic recession) are provided as points of reference:

- From FY2006–FY2016, there will be 956,613 retirement-eligible employees throughout the Federal Government, but only 586,339 are predicted to retire during that period.[2]
- The average (or mean) continued federal employment after reaching retirement eligibility is 3.1 years, which can be further refined to 3.3 years for males and 2.7 years for females.[3]
- Fifty-one percent of employees remain in the Federal Government 4 years after first becoming eligible for retirement, with approximately half of this group continuing to work for 9 more years.[4]

Nation-wide and global financial reversals have contributed to significant drops in home equity and retirement fund valuations. The recession, as well as the Boomers' longer life expectancy, are causing many individuals to delay retirement, or to consider never retiring, as indicated in several surveys sponsored by the American Association of Retired People (AARP). This increasingly apparent trend has led BusinessWeek magazine to label the Boomers as "Gen U," or "Generation Unretired."[5]

U.S. LABOR MARKET FORECAST: DEMAND UP AND SUPPLY DOWN

The U.S. labor force annual growth rate peaked in the 1970s at 2.6% and has been decreasing with each subsequent decade, largely due to declining birth rates and the stabilization of the number of women entering the labor market.[6,7] From 1996 to 2006, the growth rate declined to 1.2% and it is expected to further decrease to 0.8% between 2006–2016.[8] As the Nation's need to recruit replacement workers increases, efforts will be challenged by this further slowdown in the growth of the U.S. labor force.

Over the next decade, the projected labor force participation rate by age shows significant variation. The number of workers in the age range of 55 and older participating in the labor force is projected to be the fastest growing age group, from 38% in 2006 to 42.8% in 2016.[9] Meanwhile, the amount of new entrants coming fresh from campuses is growing at a lower rate than workers who have been in the labor force for some time. In addition to targeting the Net Generation for recruitment, agency strategic workforce planning efforts will also need to factor in ways to retain and recruit older workers.[10] The challenge will be balancing workforce experience sustainability and re-growth. More information about workforce planning can be found in Chapter 4.

IT OCCUPATIONAL TRENDS

The Department of Labor has analyzed IT occupations across industry, developing detailed statistics on the 2008 U.S. labor force and projecting IT occupational trends through 2018.[11] A descriptive summary of the IT occupations included in these projections is listed in Figure 3.1; more detailed information is listed in Appendix D.

New IT jobs creation is being driven by changing technologies and the increasing demand for secure, trusted data and systems. Network Systems/Data Communications Analysts and Computer Applications Software Engineers will experience the greatest percentage of change within their occupations as shown in Figure 3.1. The forecasted impact on the number of jobs created, by IT occupation is shown in Table 3.1. Rankings within the two data sets may differ, depending on the size of the occupation (e.g., Computer Scientists rank fourth in the percentage of growth, but tenth in the number of new jobs created). Based on this forecast, from 2008–2018, Computer Applications Software Engineers will gain 175,100 new jobs within their occupation, while Computer Operators will lose 19%, or 20,500 jobs, within their job field. Recruitment for many of the new jobs created will focus on Net-Gen college graduates who possess the latest knowledge and skills.

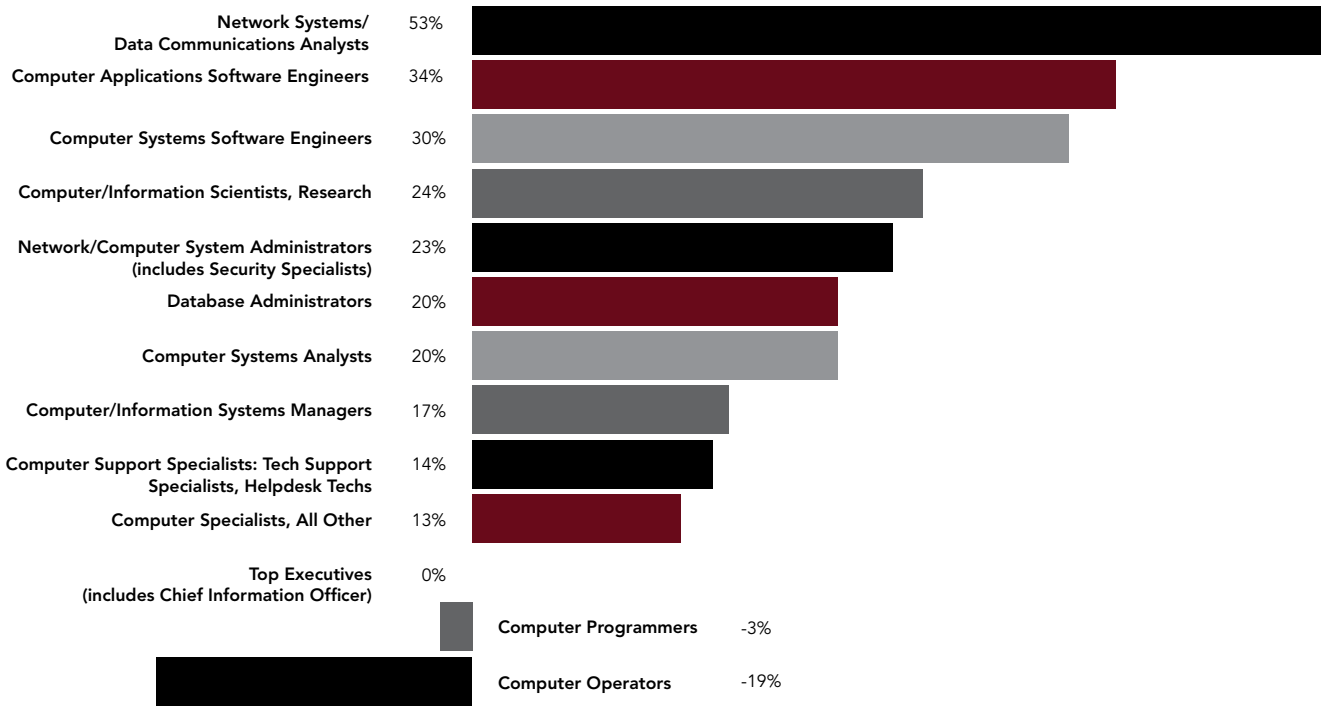


Figure 3.1 Percentage of IT Job Growth from 2008–2018
(Source: U.S. Department of Labor, Bureau of Labor Statistics)

IT Occupations	2008	2018	Change by 2018
Computer Applications Software Engineers	514,800	689,900	175,100
Network Systems/Data Communications Analysts	292,000	447,800	155,800
Computer Systems Software Engineers	394,800	515,000	120,200
Computer Systems Analysts	532,200	640,300	108,100
Network/Computer System Admins (includes Security Specialists)	339,500	418,400	78,900
Computer Support Specialists: Tech Support/Helpdesk Techs	565,700	643,700	78,000
Computer/Information Systems Managers	293,000	342,500	49,500
Computer Specialists, all other	209,300	236,800	27,500
Database Administrators	120,400	144,700	24,400
Computer/Information Scientists, Research	28,900	35,900	7,000
Computer Programmers	426,700	414,400	-12,300
Computer Operators	110,000	89,500	-20,500
NET INCREASE IN IT JOBS	**3,827,300**	**4,618,900**	**791,700**

Table 3.1 Where the IT Jobs Are
(Source: U.S. Department of Labor, Bureau of Labor Statistics)

EDUCATION

The majority of new IT jobs will require at a minimum a bachelor's degree. Technical degree requirements predominantly will include the Computer Science, Computer Engineering, Computer Information Systems, and Information Science areas of study. For more senior level IT jobs, increasingly there is a desire for education that includes both technology and business skills while some research positions require a PhD.

Two exceptions to the degree requirement are Computer Operators and Computers Support Specialists/System Administrators. In the case of Computer Operators, on-the-job training may continue to be the norm. As for Computers Support Specialists/System Administrators, recruitment selection will be driven by strong technical skills and certifications will be essential.

In the dozen years between 1991–2003, annual bachelor's degrees conferred in Computer and Information Sciences almost doubled, growing from 25,159 to 57,433, and then peaked in 2004, with 59,488 degrees conferred; by 2007, graduation rates had dropped by 30%.[12] This trend is troubling, given the expected job growth within this field and the need for new talent to replace retiring Baby Boomers. Additionally, this field includes many disciplines that are a source for critical cybersecurity jobs (e.g., Computer Networking, Systems Administration, and Information Systems Security).

Table 3.2 highlights the overall projected demand for new IT jobs. Some mitigation may be possible from redistributing individuals from anticipated Computer Programming and Computer Operator job decreases, but this action might require additional formal education for those individuals. Additionally, while general college enrollment rates are high, the graduation rates are not. In the United States, although 70% of the Net Generation will start a degree program, only 30% are expected to have a college degree by age 30.[13]

The shortfalls described assume all new IT jobs require a four-year degree; in occupations such as Computer Support Specialist and Database Administrator, two-year degrees or commercial certifications may be sufficient for some lower skilled jobs.

DIVERSITY

The primary dimensions of diversity most typically measured and analyzed in the federal workforce are age, gender, race, and ethnicity. Since it has been established previously that a college degree has become a requirement for many federal IT jobs, this section will focus primarily on the role that college education trends and workplace attitudes play in achieving gender and racial/ethnic diversity in the labor force. Workplace impacts from a multi-generational workforce are discussed in Chapter 6.

The Gender Gap - More women have earned degrees than men since the 1980s and, over the long term, the number of women awarded degrees will continue to outpace men for associate, bachelor's, and master's degrees.[14] From 2007–2019, the total number of degrees at all levels is projected to increase for women by 28% as opposed to 17% for men.[15] While women are earning more degrees in general, significant gender differences exist in the number of women obtaining bachelor's degrees in Computer and Information Sciences and Computer Engineering. Over the long term, the number of women completing degrees in Computer and Information Sciences has been declining, while there has been only a marginal increase in the number of women receiving Computer Engineering degrees as demonstrated by data from the National Center for Education Statistics:

- Computer and Information Sciences and Support Services Degrees Earned by Women: 29.4% in 1990-91, 27.5% in 1995-96, and 20.6% in 2005-06.[16]
- Engineering and Engineering Technologies Degrees Earned by Women: 14.1% in 1990-91, 16.2% in 1995-96, and 17.9% in 2005-06.[17]

As a result of these trends, women earn less than a quarter of the degrees conferred for Computer and Information Sciences and Engineering. Figure 3.2 highlights the significant gender gaps for degrees compared to the average for all degrees and across the four major IT fields of study.

IT Job Outlook Through 2018	Number of New IT Jobs
Total Demand (includes total IT job growth)	824,400
Net Demand (assumes offsets from IT job field decreases)	791,700

Table 3.2 Potential IT Growth Requiring A College Education
(Source: U.S. Department of Labor, Bureau of Labor Statistics, Occupational Outlook Handbook, 2010-11 Edition)

While industry can often hire scientists, engineers, and technologists from other countries to fill talent gaps, the tightening U.S. labor market will be further constrained for federal agencies by the gender gap in IT education. Also exacerbating the situation, female scientists, engineers, and technologists who are already in these occupations, are leaving them due to career shifts. Based on data provided in the the Harvard Business Review article, "Stopping the Exodus of Women in Science," the following reasons are cited:[18]

- Hostility in the workplace/machismo atmosphere
- Sense of isolation
- Disconnect with women's preferred work style
- Long hours and excessive travel
- Lack of sponsors to clarify career advancement

Organizations should examine female attrition in IT technical occupations to determine if problems exist. At the same time, agencies should encourage female students at the high school level to pursue IT degrees through such outreach events as the Federal IT Shadow Day or other high school education initiatives.

In 2008, college enrollment in Computer Science programs saw an upswing for the first time in six years, increasing 6.2% over 2007.[19] While this is good news, the number of women graduates remains steady, and diversity within this occupation is still an issue. Research shows that female and ethnic/racial minority interest in science and math skill areas may wane as early as sixth grade, presenting a challenge to those federal organizations and academic institutions actively seeking to improve gender and minority representation.[20]

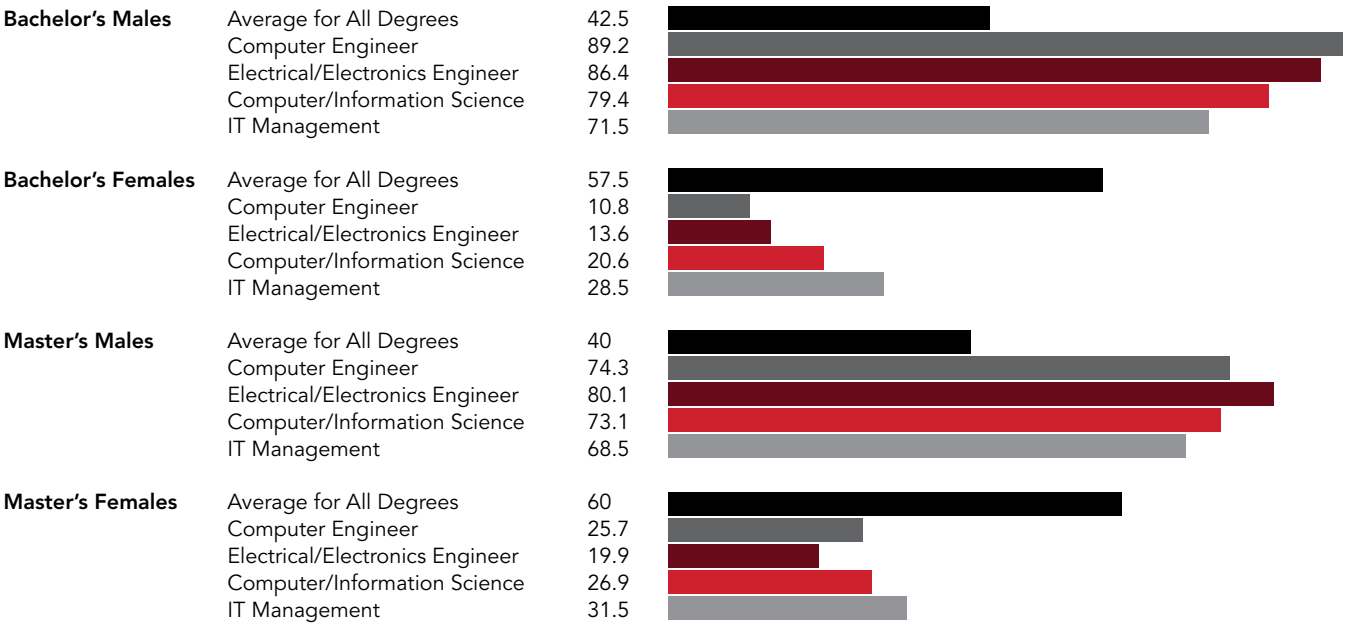


Figure 3.2 Percentage of IT Degrees Conferred by Gender for 2005–2006*
(Source: Digest of Education Statistics 2007)

* Computer Engineering also includes Computer Engineering, General, and Computer Software Engineering. IT Management includes Management Information Systems, General; Information Resources Management/CIO Training; Knowledge Management; and other Management Information Systems and Services.

Race/Ethnicity	2006 IT Bachelor's Degrees Percent Conferred (excludes non-resident)	2006 Civilian Labor Force Percent Distribution
White	67.3	68.2
Black/African-American	13.2	11.4
Hispanic/Latino	7.1	13.7
Asian and All Other Groups	12.4	6.7

Table 3.3 Diversity Perspective of U.S. Computer/Information Science Graduates Compared to the U.S. Labor Force*

Race/Ethnicity Trends - In 2003, the Hispanic/Latino community became the largest minority group within the United States. Their growth in population, due to higher birth rates and increasing immigration rates, will heavily influence the diversity of future college enrollments. Projected campus diversity between 2006–2017 includes a 39% increase in Hispanic enrollment, a 26% increase in both African-American and Asian enrollments, a 30% increase in American Indian/Alaska Native enrollments and a 5% increase in White enrollments.[21] Currently, African-Americans and Hispanics are underrepresented on college campuses in general, and Hispanics are also underrepresented in Computer and Information Sciences and Support Services majors. Table 3.3 provides a comparison of the largest IT field of study with the general labor force by race/ethnicity.

In Figure 3.3, the Computer and Information Sciences and Support Services field of study is compared to the average for all degrees conferred. This figure illustrates similar differences as Table 3.4, while also highlighting the higher than average rate of these IT degrees conferred to non-resident students. International students comprise half of the total enrollment in graduate-level science and engineering fields, with China and India at the forefront. In 2004, China made up 14% of the total worldwide international student population. During this same period, 25.3% of all international students in United States were from India and China.[22]

CHALLENGES TO IT SKILLS MANAGEMENT

As organizations try to sustain their IT bench strength, they will face several workforce management challenges. Labor supply issues previously discussed will create recruiting and retention issues. At the same time, changing job roles, resulting from the continual introduction of new technology and evolving work practices, have created a community that lacks the maturity in skill development processes and defined career paths.[23] IT leaders engaged in workforce planning and development need to factor in these variables as they plan for the rising Net-Gen workforce of the future:

Tacit Knowledge Loss - The massive Baby Boomer generation is starting to retire but little has been done to develop a means to capture tacit knowledge. As this highly experienced cadre prepares to leave, the demand for replacement skills will be further exacerbated.

Legacy Applications and Technology Support - The upcoming wave of retirements will impede the ability of many organizations to maintain skilled workers to support legacy systems. Some agencies like the Social Security Administration have taken action to transition to newer programming languages and platforms.[24] Others still view a technology shift as a long term solution, but the planning for the shift or continued support will need to occur soon.[25] As commercial training or education is

* Race/Ethnicity groupings were aggregated to enable comparison between Department of Labor data and data contained in Table 275 of the "Digest of Education Statistics 2007". Additionally, non-resident data was not included, which increased the percentage of IT degrees conferred by race/ethnicity. The field of study for Computer and Information Sciences and Support Services includes: General and Other Computer and Information sciences; Artificial Intelligence and Robotics; IT; General, Specific Applications and Other Computer Programming/Programmer; Data Processing; Information Science/Studies; Computer Systems Analysis/Analyst; Web Page, Digital/Multimedia and Information Resources Design; Data Modeling/Warehousing and Database Administration; Computer Graphics; Computer Software and Media Applications, Other; Computer Systems Networking and Telecommunications; Systems Administration/Administrator; System, Networking, and LAN/WAN Management/Manager; Computer and Information Systems Security; Web/Multimedia Management and Webmaster; Computer/IT Services Administration and Management; and Other Computer and Information Sciences and Support Services.

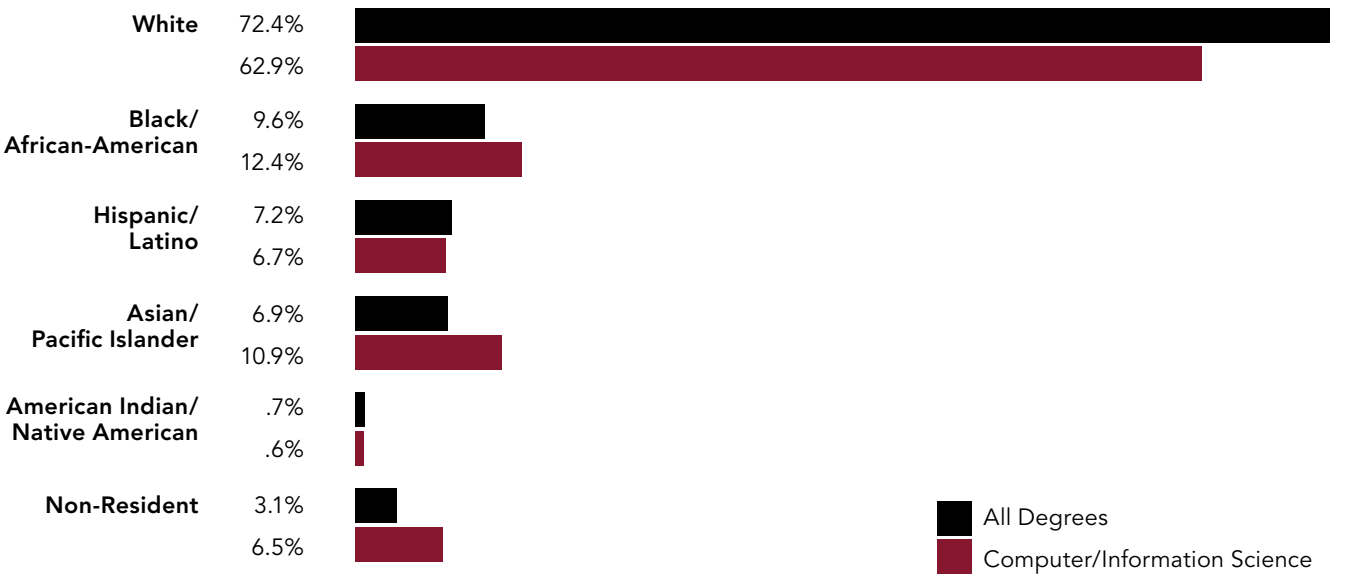


Figure 3.3 Diversity Perspective of Bachelor's Degrees in Computer/Information Sciences Compared to All Degrees Conferred in 2005–2006*

(Source: Digest of Education Statistics 2007)

no longer available, new entrants into the labor market typically will not have skills in areas like mainframes or COBOL programming language to hire as replacements for the retiring Baby Boomers.[26]

Technology Rate of Change - The introduction of new technology will continue to increase, creating a constant need to hire or develop employees with the necessary skills to meet the demand. Retraining the current workforce and creating a culture of continuous learning will be fundamental principles for organizations.

IT Hiring Increase - Two thirds of federal agencies listed IT as a mission critical occupation in 2007 and, near term, Partnership for Public Service estimates rank IT occupations as one of the top five federal hiring requirements.[27] The U.S. Department of Labor is projecting 791,700 new IT hires across all sectors, including the Federal Government, through 2018; Table 3.1 has a breakout of hiring needs by IT occupation.[28]

Citizenship Requirement - The growth of the available U.S. labor pool is shrinking and approximately 25% of the largest growing ethnic group, the Hispanic/Latino population, are not U.S. citizens. While private industry can leverage immigrants and global talent to fill crucial talent gaps, the Government's requirement for United States citizenship restricts the available labor pool. This requirement is not expected to change as the Federal Government increases its focus on cybersecurity and critical information infrastructure protection.

Intense Competition for Veterans - As the future labor market continues to constrict and the demand for talent increases, veterans will become an increasingly sought after talent pool to fill vacancy needs across government as well as the private sector. Organizations that have relied on this pipeline of talent will face increased competition.

IT Degree Shortfalls - As previously discussed, the level of students graduating with IT degrees is less than required to meet future demand and is also being negatively impacted by the gender imbalance in IT degrees conferred.[29] For 2005–2006, males outpaced females in IT Computer Management, Information Sciences, and Support Services bachelor's degrees by over 3 to 1. For Computer Engineering degrees, the male to female ratio was over 8 to 1.[30] This further reduces the supply of available talent in the labor market. To close the gender gap in IT-related fields of study, significant intervention would be required at the high school level or earlier.

Less Educated IT Workforce - Currently, Federal Government employees are significantly better educated than the private sector. As both sectors face greater turnover, the demand for available IT college graduates will increase, creating the potential for steep competition. Agencies not able to provide attractive and competitive job offers may need to re-evaluate degree requirements and offer internal degree completion incentives.

* Computer/Information Science degrees comprise 61.1% of all IT-related degrees. Data for other IT fields of study was not available by race/ethnicity.

Changes in Work Environment - The greater use of alternative work plans and workforce flexibilities, and the expansion of new work models, whether a redefinition of part-time employees or the implementation of 20-hour work week positions, will create personnel management challenges as IT leaders adjust to managing employees working on different schedules.[31]

Greater Need for Supervisory Expertise - In October 2009, the U.S. Merit Systems Protection Board (MSPB) provided a report to the President and Congress, focused on the challenges and opportunities associated with the pending loss of significant numbers of supervisory personnel in the federal workplace. The MSPB is anticipating extensive losses as current data indicates that supervisory personnel tend to be older and have more years of federal experience, thus making them highly likely to retire during the coming wave of Baby Boomer retirements.[32] In addition to noting the loss of supervisory expertise, the MSPB also described the greater burdens being placed upon supervisors due to several factors, including changing work structure models which require more networking and communication; new personnel performance plans requiring more frequent and detailed observation of individuals' performance; and the increased need to manage continuous learning and competency development in a knowledge-based workforce.[33]

Business Value Skill Set - As the focus has shifted to align IT priorities to mission capabilities, so has the thinking of the right skill mix for IT professionals. The need to integrate technology into business processes has created a greater desire for business acumen and interpersonal skills combined with expected technical skills. This will require a refinement of IT workforce skills and updating of professional development plans.

Specific IT Skills Gaps - The Federal Chief Information Officers (CIOs) Council, in partnership with the Office of Personnel Management's Human Capital Leadership and Merit Systems Accountability Division, has completed three periodic IT workforce capability assessments focused on the IT workforce. Based on the IT Workforce Capability Assessment (ITWCA) survey of 2006, four specialized job activities, enterprise architecture (EA), IT project management, IT security/information assurance, and solutions architecture, were identified as the highest importance. (The executive summary can be found at www.cio.gov).

The Association for Federal Information Resources Management's (AFFIRM) Top Ten Challenges Survey, administered annually to Federal CIOs, identified the ability to hire and retain skilled IT professionals as their top challenge in both 2007 and 2008, while also producing similar skill gap results to the ITWCA surveys of individual federal IT employees.[34,35] The five top-ranked skill gaps identified by CIOs in the AFFIRM-sponsored survey in 2008 were program management, security, collaborating across organizational boundaries, EA and strategic planning. Program management, security and EA also ranked in the top five in 2007 (collaboration and strategic planning were not including in the skills survey in 2007).

The Computing Technology Industry Association identified the following global skills priorities in its "Summary of Skills Gaps in the World's IT Workforce: A CompTIA International Research Study" (www.comptia.org):[36]

- Three most important IT skills gaps: security, general networking, and operating systems
- Widest skill gap proficiency: security, firewalls, and data privacy
- Area for most skill growth: radio frequency (RF) mobile and wireless technology.
- Other skill growth areas of importance included web-based technologies (Web 2.0, Service-Oriented Architecture (SOA), Software-as-a-Service (SaaS), Rich Internet Applications (RIAs), Asynchronous JavaScript and XML (Ajax) techniques, and specific programming languages

THE COMING NET GENERATION EDGE

During the last 50 years, most productivity gains were realized through automation and technology integration. While software and hardware enhancements will continue to reduce IT personnel resources required for routine network administration and maintenance functions, in the future, greater productivity will require a more agile IT organization. Increasing agility requires improving the ability of people to effectively respond to the unknown or unexpected; innovating or creating new methods, processes, or products; simplifying communications and information sharing; collaborating with others to execute missions and responsibilities; and most crucial, a supporting culture that inspires imagination and innovation. The agile worker is a good fit to describe Net-Geners; their energy and perspective will bring a needed dynamic to IT organizations.

ASSESSING THE IT TALENT WAR

It would be natural to think that with unemployment figures in double digits, job vacancies would have qualified candidates lining up to fill them and that the time-to-fill jobs would be greatly reduced; however, neither of these assumptions is proving true. According to a September 2009 report by Robert Half International and CareerBuilder, managers continue to face difficulties in finding qualified applicants and the average time-to-fill job vacancies remains unchanged.[37] As Liz Ryan, a columnist for BusinessWeek, puts it, "Now more than ever, employers need the sort of employees who can wade confidently into a messy business situation (a bollixed up database integration, a disintegrating tech-support function, or a six-months-delayed product launch) and clean it up."[38] And, Todd Thibodeaux, president and Chief Executive Officer of the Computing Technology Industry Association, agrees that while there are a tremendous number of IT individuals looking for work, finding those with the right qualifications remains challenging.[39]

As the economy begins to improve, jumpstarting technology projects will be a top priority of many employers, and CIOs may be looking to improve their current understaffing.[40,41] The problem many managers will face is that even while they look to expand staff, current employees may see an economic upswing as an opportunity to jump ship to a new employer, especially if the economy quickly improves. This may be particularly true in those organizations that cut salaries, raises, bonuses, or training during the recession while increasing the workload of those individuals still employed.

Jennifer Deal, a Senior Research Scientist at the Center for Creative Leadership in San Diego, California, cautions that talent management strategies, targeted to generational requirements, will be critical during the economic recovery period, particularly if the nation experiences a long, slow recovery.[42] Additionally, generational differences, exacerbated by differing levels of economic well being, and slower turnover by Baby Boomers who choose to extend their working years, may result in increased friction in the workplace, ultimately leading to greater attrition by the Net Generation.[43]

strategic workforce planning

Strategic workforce planning is a systematic process that includes forecasting both short- and long-term organizational human capital requirements, measuring current workforce capabilities and competency gaps, formulating strategies to close gaps for both current and future workforce needs, and measuring the effectiveness of those actions. The objective ultimately is to ensure that an organization has the right number of people at the right place with the right skills at the right time to fulfill the agency's strategic plan. Addressing the Federal Government's human capital challenges is a responsibility shared by many parties, including the President, federal agencies and their Chief Human Capital Officers, the Office of Personnel Management (OPM), and the Office of Management and Budget (OMB). Additionally, certain federal positions, such as Chief Information Officers, have specific functional workforce management responsibilities.

In the past, there has been a tendency for workforce planners to look at workforce behavior from a neat, 3-generation perspective, discussed below:

- Older generation: retirement-eligible and focused on their pensions
- Middle generation: the typical workforce majority, focused primarily on their compensation and benefits package
- Younger generation: future workforce, working their way up the ladder by gaining experience on-the-job or through skills training and education

This model no longer fits. Net-Geners, the youngest generation in the workforce, are not patiently working their way through the organizational hierarchy, but are instead sampling professional opportunities and moving on quickly when they see no clear cut advantages, personally, professionally, or financially, to staying. As a result, many organizations are experiencing the loss of younger workers before they can recover their recruitment investment. On the other hand, even with a large, retirement-eligible population, older generations are now staying longer in the workforce, for both personal fulfillment and financial needs. With these changing generational behaviors, there are many implications for federal IT workforce recruitment, retention and professional development including:

- Turnover will increase as retirements rise over the next decade.
- More of the replacements will come from Gen X and the Net Generation and lower-to-mid level turnover may rise due to the number of new entrants into the federal workforce.
- Some older employees will extend their careers or be willing to stay under more flexible working arrangements.
- Advancement opportunities will increase as current employees are promoted to fill gaps from increased turnover.
- More replacement hiring will come from private industry.
- More mentoring will be required which will need to be factored into managers' work schedules.
- Leaders will need to adopt and embrace different practices to retain their workforce.
- The need for resources required to recruit, train and retain will rise.

The importance of a strong, workforce planning program should not be underestimated in the successful management of a cohesive, multi-generational workforce. OPM has developed a workforce planning model which can assist IT organizations in strategic workforce planning. Additionally, in May 2008, OPM published "Best Practices in Workforce Planning," which can be found on their website, www.opm.gov. This guide is a concise workforce planning resource for all workforce managers.

Strategic workforce planning can pay dividends by helping agencies to create a stronger, more highly skilled workforce. According to a September 2009 report by the U.S. Merit Systems Protection Board, previous psychological study has concluded that "a superior skilled worker produces 32% more output than an average worker, and a superior manager or professional produces 48% more output." [1]

FEDERAL IT WORKFORCE REPORTING

During the last decade, periodically, federal agencies have been required to review the state of their IT workforce and their ability to meet agency mission requirements. At first, IT workforce initiatives were directed and reviewed separately by OPM and OMB, but, over time, evaluating the status of the federal IT workforce was folded into the overarching framework of the President's Management Agenda (PMA) and its human capital scorecard. In May 2008, significant workforce reporting elements of the PMA, as well as provisions of the Chief Human Capital Officers Act of 2002, were codified in title 5 of the Code of Federal Regulations, part 250. Those areas of the federal IT workforce considered mission critical have ongoing agency human capital management and annual reporting requirements directed by these regulations.

norms and characteristics of the net generation

Both the federal IT workforce, and the U.S. workforce at large, span five generations, with the Baby Boomers historically representing the largest working cohort. This majority representation changed in 2010 in the U.S. civilian labor force, as shown in Figure 5.1 on page 38.[1] Although the Net Generation is currently significantly under-represented in federal service, their presence will start to grow as replacement workers are hired behind the retiring Baby Boom generation. As part of the initiative to become better informed about the coming changes in workforce dynamics, the Federal CIO Council entered into a partnership with the nGenera Corporation (which includes the former New Paradigm Learning Corporation) in order to leverage nGenera's research and experience in this area. This chapter addresses the eight "norms" that characterize the Net Generation, and the attitudes and expectations that Net-Geners are bringing to the working world.

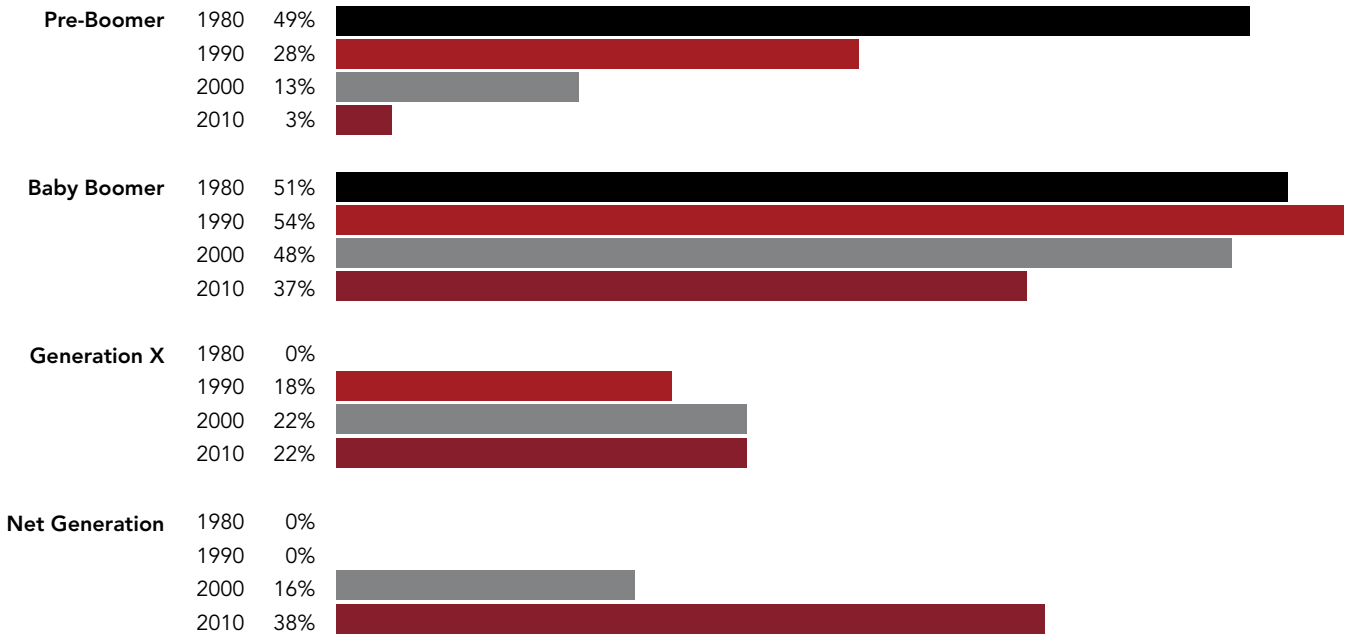


Figure 5.1 The Changing Representation of Generations at Work in the U.S. Labor Force (Source: The Bureau of Labor Statistics as reported by nGenera Insight Research)

THE EIGHT NORMS OF THE NET GENERATION

The Net Generation is slowly but surely coming to the federal workplace. The oldest of them are over 30, with education and some job experience under their belt. As a generation, they are over 80 million strong, larger in fact, than the Baby Boomer generation. They cannot be ignored as the major source of talent to recruit, develop and retain over the next decades. Additionally, there is much to admire about this generation. They are ambitious and innovative, enjoy teamwork, and understand technology. In short, they have sampled the best characteristics of each generation, while still creating their own identity and worth to the workplace.

In October 2006, the New Paradigm Learning Corporation (now nGenera) conducted 1,750 interviews with Net-Geners aged 13 through 29, in the U.S. and Canada. This research, as well as a follow-on global study, revealed and validated what Don Tapscott, nGenera Chairman, refers to as the "Eight Norms of the Net Generation."[2] These norms are patterns of behavior, which if properly channeled, can form the basis for a revitalized, innovative work culture that will benefit all employees, young and old.

The eight norms demonstrate the Net-Geners' workplace needs for flexible work schedules and overtime; social connection with their peers and a place to belong; variety in their work; leading by example and involvement, with positive feedback and public recognition; and training as a tool for productivity and retention. Understanding the implications of these norms within the workplace is critical to successfully managing the Net Generation. The eight norms are:

Freedom - The Net Generation, more than any other generation, expects to set and abide by its own priorities. Net-Geners place high priority on time with family and friends, so much so that they see their job fitting into their personal and social lives/lifestyles, instead of the opposite, more traditional behavior.[3] As discussed in Chapter 6, they are not the only generation wanting more flexibility in the workplace, but they may be the driving force behind the routinization of more flexible schedules in the workplace.

Customization - Living in a custom-created world is second nature to the Net Generation. They choose how they get their information or entertainment, when they get it, the color, configuration, and applications on the delivery device, and the picture on the credit card used to pay for it. In selecting a workplace, Net-Geners will look for choices in job benefits and will want to customize the jobs they select.[4] The Net-Gen will gravitate to jobs that allow them to do more of what they enjoy and take an interest in, possibly even affording dedicated time for specialization.[5] While it currently may be infeasible to enable customized technology in a federal workspace, engaging the Net-Gen in designing and improving work processes could yield substantial dividends.

Scrutinizers - The Net Generation is highly adept at online comparative analysis. Net-Geners in the hunt for work will carefully consider which occupations best

fit their professional goals and work style preferences; and they will thoroughly research jobs available and the associated employers' culture, benefits and emphasis on career development.[6] Once hired, Net-Geners will demand trusting and transparent relationships with their organization.[7] Because of this scrutiny, organizations should understand the benefit of a well-designed, current website and easily understandable job announcements as initial marketing efforts to future employees. However, the Partnership for Public Service recommends using both high-tech and high-touch, human interaction in educating young people about federal job and career opportunities.[8]

Based on their current scrutiny of the labor sectors, the Net Generation, in the past, had limited interest in working for the public sector as a whole, as shown in Table 5.1. However, the former Council for Excellence in Government concluded that interest in public service could significantly rise if young people were asked to serve by individuals whose opinions they respect, most notably, their parents or teachers.[9]

Integrity - As part of the scrutiny Net-Geners apply to their job hunts, they will be keen to uncover the record and reputation of potential employers with respect to their commitment to integrity and ethical practices.[10] They will not embrace a company/organization that has questionable ethics or that does not appear to translate words (policy) into action (practice), nor will they follow questionable leadership.[11]

Collaboration - The Net Generation has grown up in an interactive world. They are used to pulsing their social networks for information and feedback and working collaboratively on tasks.[12] Additionally, they want to provide their stamp on product and process development.[13] Their preference for applications and technologies that support collaboration, such as Facebook, text messaging, and wikis, along with their inherent proclivity for collaboration itself, are creating a need for organizations to identify and acquire technical and non-technical solutions for enhancing communications. This is discussed more in-depth in Chapter 9.

Entertainment - Enjoyment of the job and the workplace is also very important to Net-Geners. They want to learn new things and be a part of the action, and they expect to have fun while doing it.[14] Equally important, they tend to work hard at tasks and then want to decompress. Blocking social networking sites and discouraging any non-work internet usage basically prevents them from taking a break on their own terms, whether it be for gaming, blogging, surfing, or chatting.[15]

Speed - Owing to their demand for speed of communication, Net-Geners tend not to use more traditional methods such as the telephone and email in their personal communications, preferring the speed of instant messenging.[16] They will look for avenues to speed their productivity and response time wherever possible. This includes everything from feedback on performance to their rate of professional growth within an organization.[17] Net-Geners will value those who provide the timely feedback they desire.

Innovation - Members of the Net Generation are "digital natives." Having grown up with technology in every aspect of their lives, IT capabilities are often second nature to them.[18] And, with their desire to customize, they work hard to provide the solutions to adapt things to suit their own needs.[19] As a generation, they have the greatest facility for the IT capabilities needed in the workforce, both today and in the future.

Interest in Sectors as "Ideal Employers" | Ages 13–30	
Public Sector	20%
Non-Profit Organizations	25%
Private Sector	55%

Table 5.1 Net-Gen Interest in Labor Sectors as "Ideal Employers" (Source: nGenera Insight Research)

GENERAL NET-GEN CHARACTERISTICS

The Net Generation can be generally characterized as the most demanding generation in history, demanding challenge, meaningful work with impact, committed coworkers, and the ability to reach personal and financial goals. While recognizing that Net-Geners prefer to be viewed as individuals vice "a group," federal managers can benefit by understanding where this generation is coming from and where they want to go.

Many Net-Geners are products of hectic, dual-career families and grew up during a time of significant economic prosperity when Boomer parents were able to bankroll their technology-driven lifestyle. Additionally, this was a generation exposed to a concerted, nationwide movement by parents, teachers and counselors in the 1980s to build their self-esteem.[20] During this period, it became general practice for trophies and certificates to be awarded for every participatory endeavor, regardless of skill or contribution. The result is

a generation with a strong sense of entitlement and self-confidence, as well as a need to be recognized.[21]

Both employers and employees will need to manage their expectations, and strive to achieve mutually beneficial expectations. For the Net-Gener, this means coming to the realization that they probably won't become superstars in the workplace overnight. At the same time, employers must understand the Net-Geners expect to receive challenging assignments shortly after arriving onboard, to be recognized for achievement, and to be paid for performance. Growing up on the go, Net-Geners have been steered to maximize their time, particularly with parental influence and guidance, and may not have learned how to set work priorities themselves.[22] They believe they can do it all and expect managers to feel the same.[23]

Fame and fortune are high on the list of Net-Geners' personal goals. In a January 2007 report from the Pew Research Center, 81% of 18 to 25 year olds polled said that getting rich is their generation's most, or second most, important life goal; 51% said the same about becoming famous.[24] Money, in fact, is by far their biggest problem, with 30% citing financial concerns as their top worry.[25] Net-Geners may earn more than their parents did, but their earnings have less purchasing power. Additionally, many do not have health care coverage and may come into the workplace carrying more educational debt than any previous generation.[26] While the Net Generation may view getting rich as their own generation's top goal, it is not always a top response in work-related surveys. One of their personal top drivers when job hunting is the need to feel as though they are making a difference, according to both nGenera Insight research and surveys commissioned by the Council for Excellence in Government.

Managing in the Net-Gen World (Figure 5.2) will take more time, and perhaps more patience. Net-Geners will expect more feedback, more often, both to recognize their accomplishments and to help them move to the next stage in their work project. While they will want flexibility in how they do their work, they also need structured accountability and deadlines. Routine meetings will bore them and the formality, slow speed, and repetitiveness of government bureaucracy, will frustrate them. It will be important to educate them in the reasons for procedures, processes, and the repetitiveness of some tasks. Additionally, expect there to be give-and-take on communications. Older managers will need exposure to the greater efficiencies from text messaging and wiki collaboration, while younger workers will need tutelage on the need for documentation to meet statutory and regulatory requirements as well as verification that they can adequately judge the credibility of online sources of information.[27]

In their quest to succeed, Net-Geners will be looking for genuine mentoring. This is a generation that when asked to write about someone they respect, often selects their own parents. They respect the knowledge that others have to share, and while they may overplay their own assets, they do not underplay the skill sets that older generations have. The challenge for coaching this generation will be to know when they need supervision and when they need growing room and to make time to help them improve.

Net-Geners are also used to being heard. They will want to share their ideas with senior leaders and decision-makers. Organizations would do well to determine how to balance protocol and openness to ensure they do not stifle the creativity and energy that the Net Generation will bring to the workplace. At the same time, Net-Geners may need some mentoring on office politics and the chain of command. There is a place for both protocol and openness, but the balance is starting to tilt toward the Net-Geners as organizational hierarchies begin to flatten under the positive weight of collaboration.

As the Net Generation is integrated into the workplace, managers and leaders may discover more similarities than differences among all four working generations. Also, "cuspers," those at the beginning or ending years of a generation, may possess a mix of norms, characteristics and values, based on their upbringing and other influences in their lives. The end goal is to help teammates of different generations find common ground, mutual appreciation, and respect.

Net-Gen World

They don't want to be labeled.

They want continuous feedback and recognition.

They value genuine mentoring.

They want autonomy, responsibility, and challenges.

They need structured accountability.

They're not interested in "paying their dues."

They're used to having their opinions heard.

They're used to group/team problem solving.

They expect high tech/constant stimulation.

They're used to living in a 24/7 environment.

Figure 5.2 The Net-Gen World

In the 1960s Baby Boomers famously popularized the phrase, "don't trust anyone over 30." In general, the Boomers were anti-establishment, and did not want to conform to society's norms. Trusting anyone over 30 was seen as conforming. I was recently asked, "If the Boomers' motto was don't trust anyone over 30, then what is Generation Y's motto?" Without much thought I blurted out, "Get as many people over 30 in your corner as you can. Learn from them. And do it better."[28]

RYAN HEALY THE BRAZEN CAREERIST BLOG

opportunities and challenges of a multi-generational workforce

In anticipation of the shifting balance among the generations at work, many prominent thought leaders and professional organizations have been examining the dynamics of the workforce of the future. Through generation-focused research from nGenera Insight, Gartner, Forrester, the Society for Human Resource Management and others, the future workforce can be characterized as:

- More diverse, as measured by ethnicity, age, race, religion, family background, sexual orientation, geographic location and global connectivity, language ability, and disability
- Less immersed in work and desiring more work/life flexibility
- Technologically-savvy and having good collaboration skills

The implications of bringing such shifting behaviors and values into the workplace are significant. Transitioning the workplace to a multi-generational work environment is the focus of this chapter.

GENERATIONAL DIVERSITY

Age is no longer strictly a number, but has become a much more complex factor in managing the generation mix. Just as financial experts tout portfolio diversity as a hedge against economic uncertainty, generational diversity is important to sustain stability and stimulate innovation in a multi-functional workplace. As discussed previously in Chapter 2, each generation typically has different turnover patterns which should be managed through targeted workforce planning and cross-development of skill sets. At the same time, each generation is likely to have different work patterns, skill sets, and life experiences. Organizations which focus on inclusiveness and value the qualities and uniqueness of each individual can create an environment that encourages teamwork and innovation. And, perhaps most important, when viewing diversity within a business case structure, diverse teams deliver better results by bringing different perspectives to problem solving.[1]

GENERATIONALLY SPEAKING - ATTITUDES AND EXPECTATIONS

Employees of each generation have their own life experiences that have helped shaped their perceptions as shown in Table 6.1. It is important to be aware of these differences and to understand how the different attitudes and expectations of a multi-generational workforce interplay. Managers who can embrace these differences will be in a better position to connect with employees. The challenge will be understanding, but not stereotyping, the differences.

EMPLOYING CHANGE MANAGEMENT PRACTICES

Adjusting to the changing representation of several generations in the workplace is similar to the processes undertaken to redesign an existing organization, or to the more complex undertaking of blending two workforce cultures together as part of a merger or acquisition. The major difference is the timeline for execution. Federal IT organizations that understand basic change management practices and how to implement them, may be more adept at managing the cultural transition to an effective, multi-generational workplace.

Any change in the work environment offers both opportunities and challenges, although inevitably, the people affected by change seem to focus on the challenges. The negative perception of change is true in any business setting, be it government (federal, state and/or local), private industry, not-for-profit enterprises, trade associations, independent consultant services, and so on. Leaders who understand these dynamics and take the appropriate management steps are key to the organization successfully adapting to, accomplishing, or implementing change.

Ideally, leaders, managers, supervisors, and team leads have already begun to recognize, understand, and adapt to generational changes in the federal IT workforce. The reality, however, is that workforce planners and managers have only recently become aware of the growing diversity among the members of the workforce, and the scope of the changes that its youngest members may bring to workforce attitudes, expectations, and work habits. Effective IT leaders will need to address the changes occurring through:

Active and Open Communication - IT leaders must actively and openly communicate with their teams to raise everyone's awareness of potential workforce friction and workplace environment changes as they develop over time. The primary goal is to inform, address questions, dispel fear, and alleviate concerns that individuals may have; and how they may contribute constructively to change. Increased communication regarding the varying attitudes, expectations, and styles each generation may bring to the workplace; how each generation learns and communicates; commonalities and distinctions in how they view and accomplish work; the competencies and experiences each brings to the table; and how the current team members can get involved set the stage to most effectively manage such challenges.

Hands-on Execution of Change - It is important to engage all generations during major organizational changes. Each generation brings particular expertise to the table, and also, may assimilate changes differently. Younger, more technically-savvy workers who demonstrate the ability to interject greater efficiency through technological solutions can provide training on these capabilities, while longer-term employees bring extensive corporate knowledge, including culture, process, and statutory/regulatory requirements. Managers must be able to guide/facilitate each change process; be available and open to feedback, questions, and concerns; and aid their team in working through any issues which may arise along the way.

Periodic Assessments - Creating an atmosphere and an attitude of inclusion is not a one-time event. Managers will need to remain available to hear about and take action on unhealthy dynamics, to lead periodic team discussions or conduct periodic evaluations of the work environment, and to follow through to resolve situations as they arise.

Age bias, whether toward the old or the young can be very real. Beyond stereotypes and age-related humor are management practices that are not inclusive, and negatively impact workforce performance. Barriers to older workers may include not considering them for potential advancement, not keeping their skill sets current through professional development, and, either not considering them for a job hire to begin with, or not crafting recruitment or retention incentives that speak to their individualized needs. For younger individuals, the concern is that age-based (i.e., years of experience) rigid recruiting requirements can prevent them from being considered for a job, or, if hired, that as "new kids on the block," they cannot get a seat at the table to get their views heard.

	Greatest Generation	Baby Boomers	Gen-X	Millennials or Net-Gen
Age	64–84	45–63	32–44	19–31
Population	75 million	78 million	45 million	80 million
Key Characteristics	Pragmatic Conservative Conformists	Value-driven Priority on Self-actualization	Cynical Media-savvy Individualistic	Tech-savvy & Diverse Media-saturated Fluid Lifestyle
Defining Events	Great Depression World War II Korean War	Berlin Wall Up JFK, MLK, RFK Shot Watergate Vietnam	Berlin Wall Falls Challenger OJ Simpson First Gulf War	Columbine, VA Tech OK City & 9/11 GWOT Corporate Scandals
Key Values	Accountability Tradition Stability	Fulfillment Indulgence Balance Equality	Freedom Reality Self-reliance Work/Life Balance	Diversity Flexibility Empowerment Service-oriented

Table 6.1 Understanding the Generations Through Life-Defining Events

	Pre-Boomer	Boomer	Gen X	Net-Gen
Satisfaction with Employers	85%	74%	77%	79%
Satisfaction with Jobs	76%	71%	70%	74%
Willing to Go the Extra Mile	81%	81%	77%	72%
Pride in Working for Employer	89%	79%	81%	85%
Fairly Compensated	61%	53%	53%	55%

Table 6.2 Generational Satisfaction Levels
(Source: Sirota Survey Intelligence as reported in HR Magazine)

THE MATURE WORKFORCE

Pre-Boomers are loyal, have seniority, and generally hold positions of authority. Their perspectives were formed by a time of great financial struggle in the Depression and the advent of World War II, which mobilized the entire country, both at home and on the battlefield to work for victory. Boomers grew up during a period of radical change, including racial integration, the Women's Movement, organized rebellion to war, and impeachment of the President. They know how to pay their dues, compete with cohorts, and struggle through corporate and government downsizing.

More mature workers typically prefer more structure in the work environment and are comfortable with directive, chain of command leadership. They also are more likely to understand the big picture and specific agency missions due to their longer association with an organization. They contribute corporate knowledge to all facets of work, including a historical perspective of which policies and corporation actions have worked as well as the rationale for prior decisions. Boomers typically value teamwork.

Employee attitude surveys conducted by Sirota Survey Intelligence (specialists in attitude research) in 2006–2007 support these characterizations of the mature workforce. The surveys found that while stereotypes still exist, increasingly employers understand the value that older workers bring to the workplace. They have significant work experience, organizational and historical knowledge, possess a strong work ethic, and provide excellent customer service.[2] Survey results also revealed Pre-Boomers have a higher level of satisfaction, pride, and willingness to go the extra mile for their jobs; in addition, of all the generations, "they feel their skills are best utilized and they are best able to understand the larger picture of how their job connects to the overall goals of the company."[3] Table 6.2 illustrates generational job satisfaction levels.[4]

Federal agencies would benefit by examining the demographics of their management teams and projecting potential gaps created by their retiring workers. For those who intend to leave, mentoring opportunities should be arranged so that more mature workers can share their knowledge and experience before they retire. Additionally, organizations should consider succession planning for high potentials and determine whether their development can be accelerated. For those who might stay on, retention may hinge on looking past prior experience and career aspirations and determining what each individual wants to do and enjoys doing now.

Retirement as a concept continues to change. Rather than the sharp drop in productivity and prestige that came with traditional retirement, now retirement may look like gradual downshifting, with meaningful workplace productivity continuing well into the 70s, or a continued ramp up with a second burst of productivity and career growth in another field as described by Tamara Erickson in her book, *Retire Retirement*.[5] In either case, Boomers will be interested in continued professional development to maintain proficiency or obtain new skills.

GENERATION X

Gen-Xers grew up as societal free agents, and are very individualistic when compared to the team-centric Net-Geners. They are "the latchkey generation," the first to typically have two working parents and a 50/50 chance of being from a divorced household, resulting in less childhood supervision.[6] Additionally, because their parents came of age during a time of great social unrest, many do not have strong affiliations to large institutions, whether they are government, academic, religious, corporate, or political in nature.[7] During their most formative work years, Gen X has seen extreme hiring and firing trends; first, Boomers getting pink slips in the 1980s as corporate loyalty faded away, then the opportunities presented by the low unemployment years in the 1990s, followed by the dot.com bust, and the more recent recession. As a result of so much instability, Gen X constantly monitors organizational climate and career opportunities. They are the ultimate contingency planners, ready to hop to the next job if their job situation sours; many have a backup plan at all times.[8]

Pre-Boomers	Work hard because it's the right thing to do
Baby Boomers	Work hard because it defines you, and you can make a difference
Generation X	Work hard so then you can play hard
Net Generation	Work hard at work that has meaning

Table 6.3 Defining "Work Values"
(Source: Organizational Renewal Associates)

Gen-Xers are flexible and adaptable by nature. Having learned to rely on themselves to land on their feet, in business they can be independent thinkers, willing to break the rules, and possessing a high tolerance for risk; these attributes can serve them well in entrepreneurial roles.[9] Additionally, since they are not typically "joiners," Gen X may prefer solo projects rather than team assignments. Although their average tenure on a job is three years, they are more likely to stay longer with organizations that tap into their creativity and entrepreneurial spirit by offering them ongoing opportunities to learn and add value to the organization.

In size, Generation X is sandwiched between two substantially larger generations. One HR blogger, Kris Dunn, referred to Generation X as the middle child, through a Brady Bunch metaphor: "We are Jan Brady—compliant and serviceable, but never featured on the cover of the brochure. It's always about Marcia (the Boomers) or Cindy (Gen Y)."[10] Yet, managers also need to focus on that middle-child generation, grooming them for increased responsibility, targeting them for recruitment and retention, and valuing their independent nature.

NET GENERATION

The Net Generation, discussed more in depth in Chapter 5, has witnessed major, inexplicable violent acts such as the high school shootings at Columbine, the more recent killings at Virginia Tech, and workplace bombings in Oklahoma City, the World Trade Center, and the Pentagon. Additionally, they have seen business scandals, such as the corruption at Enron, and the recent implosion of major financial institutions, as significant influencers on their parents. These life-defining events have influenced a "live for today" spirit, which when combined with the longer time they are expected to be in the workforce, allows them to make their 20s a period of great exploration, particularly if they have the security blanket of parental support.[11] There is some speculation, by both researchers and Gen X bloggers, that when more of the Net Generation starts having children, their "restlessness" may ease. And, while some labor studies have predicted the Net Generation will hold many jobs in their life time, more recent studies of this generation imply that they would prefer to work for fewer organizations, but to have more opportunity for growth, with the option for internal lateral or vertical moves.[12]

WORKPLACE EXPECTATIONS

Even with differing life experiences, fundamentally, many individuals in the workplace have similar job desires, no matter what their generation. For the most part, the job needs to be well-paying, with interesting work. It needs to provide them with opportunities for both professional and personal growth, as well as a path for advancement. Leadership within the organization must be supportive, credible, and behave with integrity, providing recognition for a job well done. Where expectations differ is in how these desires are prioritized, the balance between work and home life, and the way work is viewed. Table 6.3 provides a description of generational attitudes toward work, which was presented at the Association of Government Accountants' Sixth Annual National Leadership Conference in Washington, D.C.[13]

Values are different from behaviors, however, and it is the understanding of these behavioral differences that will be of great help to managers. For example, while all generations believe in working hard, the perception of hard work differs. Pre-Boomers are more likely to equate hard work to being physically present, and perhaps even being present long after "normal" work hours are over; this has been referred to colloquially as "butt in chair" or "BIC."[14] Boomers expect significant BIC, combined with other forms of visible presence, including meeting attendance and teamwork activities. On the other hand, neither Gen X nor the Net-Gen link hard work to physical presence in the office. This can understandably cause friction as Net-Geners and Gen X push for more flexibility and balance in the workplace. Federal managers will be challenged to change the current culture and form new measures of accountability and productivity that will satisfy organizational and individual needs.

management and employee engagement

Management studies have shown that corporate culture has a significant impact on organizational productivity. Thus, corporate culture influences not only the Net Generation, but all individuals in an organization. The U.S. Merit Systems Protection Board (MSPB), in "The Power of Federal Employee Engagement," echoed many of the same themes discussed in Chapter 5 on creating a positive work experience, applying those themes across the entire federal workforce. The MSPB report focused on six factors which contribute to federal employee engagement (as shown in Table 7.1 on page 50), and highlighted the significant role of the first-line supervisor in employee engagement.[1] Managers intent on improving agency performance and productivity need to ensure their first-line supervisors are up to the task of supervising a diverse workforce. This may require retraining or reassigning individuals who have not been given the appropriate tools or who do not possess the necessary attributes and skill sets to excel as supervisors. Equally important, given the expected increasing turnover as more senior individuals retire, it means identifying potential future supervisors or team leads and giving them opportunities to practice and develop these skill sets.

The goal is to develop managers with a broad level of self-engagement, who are good at personal interactions, value employee career development, and appropriately recognize their achievements. Additionally, organizations need to ensure individuals have the proper workplace tools to succeed, with more flexible work processes. These activities, coupled with continuous methods for feedback and recognition, can foster high individual, workgroup, and organizational performance.

In December 2009, a final rule was issued in the Federal Register to implement changes to 5 CFR Parts 410 and 412, regarding agency training programs and supervisory, management, and executive level training. These amendments, effective immediately, were spearheaded by the Office of Personnel Management (OPM) and include requirements for agencies to train new managers in supervisory positions on mentoring, employee development, conducting performance reviews, and dealing with poor performers; periodic training for managers is now also required at least every three years.[2]

Engagement Contributors

Pride in One's Work or Workplace

Satisfaction with Leadership

Opportunity to Perform Well at Work

Satisfaction with the Recognition Received

Prospect for Future Personal and Professional Growth

Positive Work Environment with
Some Focus on Teamwork

Table 7.1 What Engages Federal Employees (Source: U.S. Merit Systems Protection Board)

COMMUNICATING THE VISION

All organizations can benefit by having a vibrant, visionary workplace. Although most government organizations have a vision statement, fewer live their vision on a daily basis, have communicated it adequately, and, of paramount importance to the Net Generation, show current or potential employees how they personally contribute to the vision and mission. nGenera Insight research suggests that the Net Generation responds to "signature experiences" that align corporate values and actions with their own values.[3] Thus, organizations whose vision is not authentic, or not easily discernible, may find it harder to recruit, engage, and retain Net-Geners.

In May 2007, the Council for Excellence in Government and the Gallup Organization published a report based on survey and focus group results which explored the attractiveness of federal employment. Among the data was the respondents' rated awareness of 25 federal organizations and their interest in working at these various federal agencies and organizations. Only 7 of the 25 agencies evoked high awareness or high interest from the respondents.[4] This may be a problem for the federal organizations which evoked low interest and/or awareness, as they collectively employ over 30%, or 31,000 members of the Major Federal IT Community. More recent research suggests that the timing is right to engage today's youth in government service. Another May 2008 report by the Council for Excellence in Government stated that while 60% of today's youth have never been asked to consider working for the government, many would consider it if influencers such as their parents, teachers, peers, or the newly elected President asked it of them.[5] Additionally, government organizations have been appearing on the top ten list of ideal employers for college, as show in Table 7.2.[6,7] Of the government organizations cited in Table 7.2, NASA, the FBI, the CIA, and the U.S. Department of State were rated in the May 2007 Council for Excellence in Government report as very interesting places to work, with NASA, CIA and Department of Justice also scoring high in awareness of agency mission. (The Peace Corps and Teach for America were not part of the 2007 survey on government employment). It is interesting to note the lack of government organizations in the 2009 top ten list of ideal employers; this may indicate a downshift in federal employment awareness activities.

As organizations look to increase awareness and engagement, their own website can be a good starting point. Government websites are often not enticing visually; they can be cumbersome to navigate; and few make a strong, conscious attempt to connect to the viewer, provide a sense of "corporate culture," or to tie their workforce to the mission. That can be a problem, since most likely, that website will be a Net-Gener's first and, perhaps, last impression of the organization. And should there be information that a Net-Gener wanted to bookmark or share, appropriate information sharing technology tools are often either rudimentary or noticeably absent.

CIO organizations should be keenly aware that their agency's website, as well as their use of current social media, are really, in a sense, their own calling card to the Net Generation IT workforce on whether their agency is an interesting place to work and how technology is being used within the organization. Some of the more savvy organizations in industry and government are now creating a "brand" for themselves as well as establishing a presence on social networking sites. Activities may include posting job applications, but for many organizations these sites also provide an opportunity to create organizational awareness among the passive job seekers. Since passive job seekers are the vast majority of the talent pool, this can be an effective marketing tool, if properly managed; only a small percentage of the labor market is actively seeking a job on the major job market sites at any given time.

2007	2008	2009
1. Google	1. Google	1. Ernst & Young
2. Walt Disney	2. Walt Disney	2. Google
3. Apple	3. Apple	3. PricewaterhouseCoopers
4. U.S. Department of State	4. Ernest & Young	4. Walt Disney
5. Peace Corps	5. U.S. Department of State	5. Deloitte
6. CIA	6. Goldman Sachs	6. KPMG
7. PricewaterhouseCoopers	7. Deloitte	7. Apple
8. Microsoft	8. Peace Corps	8. J.P. Morgan
9. FBI	9. NASA	9. Goldman Sachs
10. Teach for America	10. PricewaterhouseCoopers	10. Nike

Table 7.2 College Senior List of Ideal Employers (Source: Universum Communications)

JOB FIT

Matching the right person to a real job requires work, however, a good person-to-job fit can improve employee engagement, decrease turnover, and improve overall agency productivity when the individual is well-suited to perform the job. Agencies need to identify the competencies, types of work assignments, and team roles to be performed and whether they should recruit to specialized technical skills, to generalist capabilities, or to hire "versatilists," a term Gartner, a leading research and advisory firm, uses to describe individuals with deep skills as well as a broad scope of job roles and experience.[8] They also need be able to identify the level of experience, skills, and capabilities required, and as mentioned previously in Chapter 3, to realize the costs, tradeoffs, and attainability of those requirements when in a tight labor market. Finally, government agencies, in particular, need to examine their position descriptions and to write them with a level of simplification and clarity that make them understandable not only by agency insiders, but also Human Resources (HR) specialists and potential job applicants outside of government.

While a Net-Gener may not currently have the depth of skills and experience to be a versatilist, the concept of developing into one could be very appealing to this generation. It appeals to their desire to master more than one skill set and not be pigeon-holed into a narrow, pre-defined career. Additionally, the desire and trend for having employees with both IT and business skills is becoming more prevalent within the CIO community.

ENHANCING THE HIRING PROCESS

The federal hiring process is imbued with challenges to overcome and continues to be cited in numerous publications as a potential obstacle to attracting talent for federal employment. The Partnership for Public Service detailed many of these issues in two 2008 reports: "Road to Reform, A Management Framework for the Next Administration," and "Elevating Our Federal Workforce; Chief Human Capital Officers Offer Advice to President Obama." And, OPM continues its work to improve the process.

Rather than concentrate on large scale systems and processes that could require significant retooling across government, CIO organizations should focus on two areas where they can have impact: the relationship they have with the HR community and their own role in the hiring process. Creating a strong partnership with HR can help in determining strategies on job marketing, compensation and the best use of hiring flexibilities, including, but not limited to, those discussed in Chapter 10. Additionally, HR is a partner in qualifying candidates for interviewing. Getting to the interview stage, and conducting meaningful interviews, are where an agency can go astray by taking too long to identify candidates for interview, not creating a structured interview process or by allowing unskilled individuals to conduct the interview. Interviewing is a skill worth honing, particularly with the Net Generation.

During the interview/hire process, interviewers should clarify the mission, functions, and tasks of the organization, and the specific duties and responsibilities the applicant would be expected to fulfill. Ideally, they are providing the type of information that might help aspiring applicants understand what a "day-in-the-life" of the job may be, and how their role would fit into the bigger picture. While interviewers should be assessing how the individual may fit the organization, they must also allow ample time to answer questions the individual may have.

The MSPB recommends using a structured interview process and work sample assessments to create a best fit between potential applicants and an agency.[9] Behavior-based interviews, which can provide insight on desired soft skill requirements, can be targeted to address areas such as judgment, decisiveness, flexibility, negotiation, risk taking, values and ethics, problem solving skills, interpersonal relationships, and people management, whereas open-ended questions, asked of all applicants, are tied to specific desired behaviors, with benchmarked responses. While it takes time to develop the questions and train the interviewers, behavioral interviewing, which is based on actual past performance rather than hypothetical situations, has been found to be significantly more effective at predicting on-the-job performance.[10]

ON-BOARDING NEW EMPLOYEES

Both the hiring and on-boarding processes should be designed to provide the right start to new employees of all generations, including bringing them into an agency's culture as quickly as possible. Near term, a positive experience will form the basis of the employees' full integration into the multi-generational workplace. Longer term, it will provide new employees the tools they need for success, and potentially influence their future retention as well.

The on-boarding process has to balance among the necessary, but mundane activities such as administrative paperwork, credentialing and security, and more complex activities such as individual sponsorship (a concept the U.S. military uses by assigning each newly reporting individual a sponsor from the command) and socializing employees to the workplace by introducing them to the incumbent staff, touring the office spaces, and showing them the ropes. Ideally, equipment issue and work area setup will have been performed before the new employee's arrival since encountering problems with technology integral to job performance can be a turnoff to any generation.

The on-boarding process should be conducted in an order and timeframe deemed most beneficial to provide information on policies and programs; individual/team roles and responsibilities; organization strategy, charter, mission, and goals; and management philosophy and standards. The challenge is to meld necessary content with context, particularly for the new Net-Geners in the workplace, but also for any new employee. Individuals need to understand how the work gets done, where to go to get help, who it is important to meet and how each individual will inform their social network. Early focus on acculturation can harness the enthusiasm of typical Net-Geners, who are keen to get started right away to make an impact and to be recognized for their contributions.

Managers will play a key role in integrating the new employee into the organization. They should be comfortable discussing their expectations of the employee and should be equally comfortable asking the employee what his or her expectations of the job are. This give-and-take is important to Net-Geners. It is also important to realize that the timeframe to expect full productivity from employees can be several months. This is a critical time to ensure that Net-Gen employees are receiving frequent feedback on their performance and that they are, in fact, forming the networks that can help them optimize their performance.

Finally, understanding that both processes and people form the basis of a successful on-boarding program, organizations should take a hard look at their current procedures, and the individuals who typically carry out the on-boarding processes and conduct periodic reviews to ensure the on-boarding experience is fresh and relevant. Areas to scrutinize include:

- Does each new employee get a quality introduction to the organization?
- Do new employees get one-on-one conversations with key staff personnel?
- Do employees understand the agency mission and their role in fulfilling that mission?
- Are employees made to feel as though they are valued and their career goals supported and attainable?
- Is the program customizable to meet individual needs?
- Does someone track completion of the onboarding process and get feedback on how the agency can improve it?
- Is the program structured to fulfill its objectives?

In May 2008, the Partnership for Public Service published an excellent guide, "Getting On Board: A Model for Integrating and Engaging New Employees," which

The primary shift in managing the Net Generation is the move away from a generic set of people management practices to ones that are more user-focused and individually-customizable. Expectations of authentic relationships between employees and employers create pressure on leaders to demonstrate care and concern for particular employees. This new management reality requires leaders who interact differently with each employee, and work hard to understand young people's personal aspirations and preferences, strengths and weaknesses, and informational needs. To lead the Net Generation effectively, managers will need to assume the roles of coach, educator, delegator, knowledge broker, resource allocator, and advocate.[11]

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can be found at www.ourpublicservice.org. This report includes an on-boarding toolkit for managers and a model for the first year's activities with a new employee.

PROFESSIONAL DEVELOPMENT

The availability of professional development and career management support is a key factor in employees' engagement, and ultimately, their retention. This is particularly true for both the Net Generation and Generation X. Chapter 8 is dedicated to these topics, providing more information on job experiences, coaching/mentoring, and formal learning.

MANAGING PERFORMANCE

Federal managers and supervisors have a responsibility and an obligation to manage the performance of their employees. Although all federal agencies have performance management processes in place to guide them, these are not always well executed. It could be fair to say that some managers, whose personnel population is skewed to older, longer term employees, have been able to put their performance management practices on auto-pilot. This must change. Net-Geners entering the federal workplace will want more tangible feedback on what is expected of them, how they are performing, and how their performance is linked to their pay.[12]

For the Net Generation, the frequency of the feedback is also very important. During a 2008 nGenera Insight survey of over two thousand individuals in North America, respondents were asked how frequently they desired feedback from their managers. Figure 8.2 (page 54) illustrates that the younger the individuals, the more frequently they wanted manager input on their performance.[13] This has two-fold implications for employee supervisors or team leaders: more training may be required for managers on performance management techniques, and managing employees will take more time.

Managers who utilize a variety of leadership styles with employees will be better equipped to manage in a multi-generational performance management environment. This includes consciously taking time to understand what is important to each generation, and particularly, to take time with individuals to appreciate their personal and professional experiences, background, motivators, goals, and needs. All of this information can be used to develop an adaptive performance management style which will enable a manager to draw on the strengths of each generation represented on the team when assigning individual or team tasks and projects.

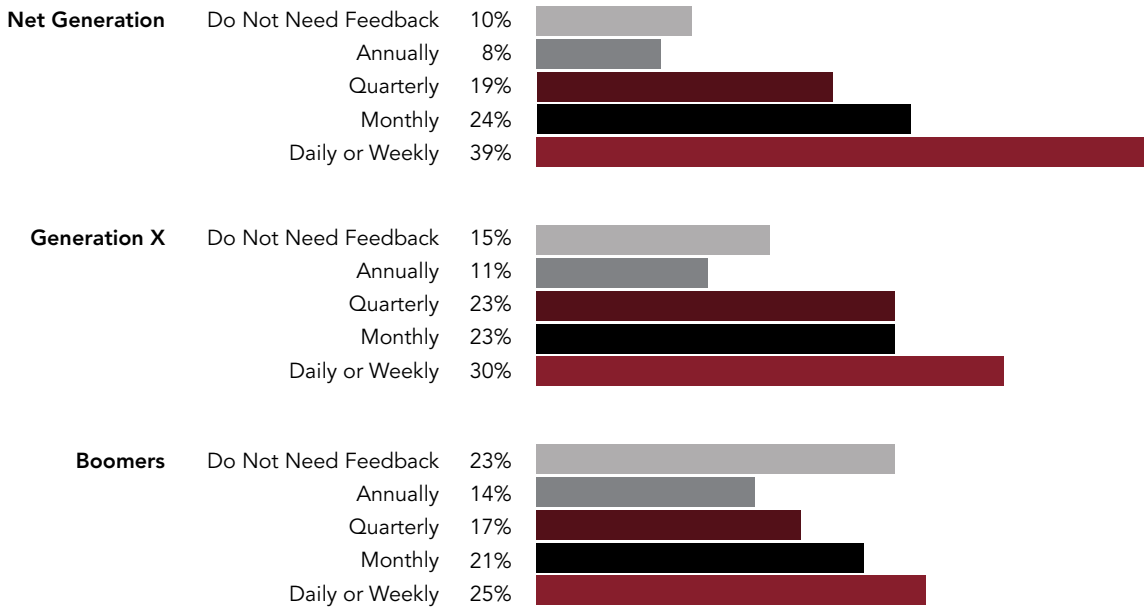

Figure 7.2 Desired Feedback Frequency from Managers (Source: 2008 nGenera Insight Survey)

RECOGNITION

Since the Net Generation expects frequent and timely feedback on job performance, organizations will need to become more adaptive, relying much less on formal, scheduled, semi-annual performance reviews and the once-a-year, cash award performance recognition model that is so often employed. Creating a more dynamic and personalized awards system will resonate with the Net Generation. Getting to know them and what they value will require more awareness and communication within an organization, while actually involving them in the creative process of restructuring an agency's award program could yield unexpected innovativeness. Within the more traditional federal award opportunities, the three discussed below may warrant increased utilization to recognize Net Generation accomplishments.

TIME-OFF AWARDS

Using an Individual Time-Off Award for personal work accomplishments, or a Group Time-Off Award for collaborative work, can be a viable way to increase Net-Geners' personal, paid time away from the job and provide positive, tangible recognition to a generation of workers who thrive on performance feedback.

The Time-Off Award program is highly flexible. Agencies are empowered to determine administration details including the approval authority, the number of days which can be awarded, and the timeframe for award utilization. Additionally, a Time-Off Award can be combined with other types of awards. A cash bonus of $100 and a day off could be part of an informal quarterly recognition system which easily could be administered within an organization.

Use of the Time-Off program accounted for 19% of annual performance awards conferred by the Federal Government in FY2007.[14] The average federal Individual Time-Off Award in FY2007 was slightly more than two days (17.7 hours) in length.[15] The Department of the Treasury had the highest average award at 34.3 hours, and the Social Security Administration had the lowest average at 2.3 hours. Among the Federal CIO Council members, the Department of the Air Force had the highest usage rate and the U.S. Department of State and General Services Administration had the lowest usage rates. Group awards, another option, accounted for less than 20% of time-off awards, with an average award of 9.5 hours.[16] This could change as the more collaborative, team-oriented Net Generation enters the workforce in greater numbers. Appendix E contains aggregate Agency Time-Off award usage for FY2007, the latest data reported by OPM.

SUGGESTION/INVENTION AWARDS

The Net Generation thrives on innovation and collaboration and will be positively motivated by managers who listen to their suggestions. Creating an innovative culture starts from the top, down, requiring a supportive physical and technological work environment, an embracement of risk management, and the systematic recognition of results. Only 40% of respondents to the 2008 Federal Human Capital Survey felt that innovation and creativity were rewarded in their organization.[17]

Their viewpoint is supported by annual award data. In FY2007, less than 0.3 % of all annual federal awards were given for suggestions or inventions, either individual or group-initiated. The average award was $406, and the Department of Defense awarded 75% of all awards.[18]

Federal Chief Information Officers, tasked to implement the Web 2.0 wave of technological innovation, should embrace this award category and ensure their voice is heard when agency awards budgets are created. Over $1.5 billion was awarded in individual and group performance cash awards in FY2007 versus $2.3 million for suggestions and inventions.[19]

VOLUNTEERISM - OPPORTUNITIES AND RECOGNITION

The Net Generation was raised to value service time given in support of a local, regional, or national effort. Many were first introduced to this concept as a school or scouting compulsory project, and then continued to volunteer on their own time. Their predisposition for volunteering and desire to give back can be accommodated with their work schedule by allowing individuals to participate in an alternative work schedule or to schedule time off for volunteer activities (as discussed at www.opm.gov). Recognition of volunteerism can be done within an agency award program (cash awards are discouraged by OPM) or through the President's Volunteer Service Award program (www.presidentialserviceawards.gov). There are four categories of presidential awards based on the number of service hours performed and a bronze award, the lowest award category, requires only 100 or more hours of service. Using this program requires commitment from the federal agency to become a verifying organization and commitment from the individual to track volunteer hours accumulated.

OTHER RECOGNITION OPPORTUNITIES

Organizations have the opportunity to get creative as they build a multi-faceted award program. Awards/ incentives could include:

- A professional development quota valued by the individual
- A unique mentoring opportunity, such as a scheduled office call with a senior manager of the employee's choosing
- An in-house, peer recognition program
- A congratulatory letter or certificate presented by senior management
- A framed artifact from a special project
- Nomination for federal or industry-level recognition programs
- Supportive career transition training
- Administrative time for early release on a special occasion
- Media recognition of individual professional accomplishments

Agencies should also look externally for other federal, industry, and professional recognition opportunities as they seek creative ways to tailor awards to individual needs and interests.

RETAINING THE NET GENERATION

While it holds true for all generations, improving management and employee engagement is particularly important to retaining the Net Generation. If agencies do not create effective talent management programs that engage their employees, they are at risk for churn at both ends of the generational spectrum. Not only will they face the impending Baby Boomer retirements, but they will also face more rapid turnover among the younger workforce.

Rather than shut them down, employers should put N-Geners in charge of resolving the technical, legal and cultural obstacles that currently inhibit Web 2.0 adoption. These new collaboration tools have enabled tremendous innovation on the public Internet, and properly supported and secured collaboration tools can also foster greater innovation, agility, and cross departmental collaboration in the public sector.[20]

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"GOV 2.0 WIKINOMICS AND GOVERNMENT DEMOCRACY"

professional development and career management

Aside from the Net Generation's arrival to the IT workforce, new work processes, development methods, and changes in technology are pressuring traditional workforce development approaches to change. For the IT workforce, optimally, in order to keep pace with a dynamic, technology-driven environment, learning must take place throughout an employee's working life. The Net Generation understands and embraces this model, while preceding work generations, those traditionally responsible for employee development, may still view work and learning as distinctly separate. These different viewpoints can cause friction between Net-Geners (who view on-the-job training (OJT) as integral to their jobs) and seasoned employees (who may view training as overhead with unquantifiable value to the organization).

Although the Net Generation values one-on-one time and OJT, they also desire a clear, structured means for professional development and career management.[1] CIO organizations should create a professional development strategy for employees, establishing baseline skills and knowledge requirements, developmental methods, and opportunities designed to expand skills and knowledge. The challenge for organizations will be to provide a formal, yet customizable process for professional development and career management that not only aligns to the organization's IT workforce vision but also satisfies the needs of both Net-Geners and more-experienced employees.

Leadership and Management	Creativity and Innovation External Awareness Flexibility Resilience Strategic Thinking Vision Conflict Management Leveraging Diversity Developing Others Team Building Accountability Customer Service Decisiveness Entrepreneurship Problem Solving Technical Credibility Financial Management Technology Management Partnering Political Savvy Influencing Negotiating
Technical	Common Technical Competencies Subject Matter Expertise
Fundamental	Interpersonal Skills Oral Communication Public Service Motivation Integrity and Honesty Written Communications Continual Learning

Table 8.1 Competency Building Blocks for the Net Generation

COMPETENCY DEVELOPMENT

Each federal employee is expected to achieve high performance in a number of personal and professional competencies. Table 8.1 displays the major building blocks in these competencies. There are fundamental competencies of benefit to all, the technical competencies associated with the individual's career field and particular job, and leadership and management competencies developed by the Office of Personnel Management (OPM) as part of the Executive Core Qualifications (ECQs). The ECQs define those competencies needed to "build a federal corporate culture that drives for results, serves customers, and builds successful teams and coalitions within and outside the organization."[2] There are five OPM ECQs: leading change, leading people, producing results, possessing business acumen and building coalitions.[3] While the level of ECQ development will deepen as individuals mature within the federal workplace, it is wise to begin consciously developing the next generation for new leadership roles as early as possible. This training may be particularly attractive to Net-Geners who are eager to make an impact.

Training, education, and development opportunities that align to the ECQs can be included in employees' Individual Development Plans (IDPs) as career-broadening opportunities and would be part of the employee's long-term development options.

INDIVIDUAL DEVELOPMENT PLAN

Working together, the supervisor and the Net-Gen employee should collaborate on an Individual Development Plan for the employee. The "wired" nature of the Net-Gen employee suggests that development programs for them should leverage technology and be varied in manner of presentation.[4] For the Net Generation, it will be normal to learn on the job as they work.[5] Additionally, they may increasingly learn job functions through the use of simulation.[6]

A good IDP should address all aspects of an individual's developmental needs and feature education, training, and work-based experiences. It should be flexible and adaptable over time, and should include opportunities to develop functional occupational, technical, business and leadership competencies. In the short term, the focus should be on training that supports the Net-Gener's ability to acclimate to the agency and federal culture and on the skills necessary to complete his or her work responsibilities. This may include some fundamental training for those new to the working world in areas such as manners, social skills, professional dress, IT etiquette, and basic communications skills.[7,8] Additionally, there may be a need for leadership to clarify workplace expectations. This can pay off since Net-Geners are good at following rules as long as they understand the rationale.[9]

To build the IDP, the supervisor might ask the following questions of their Net-Geners, which were adapted from the Department of the Navy's "Civilian Career Path Guide for Management of Technology, Information, and Knowledge Workers":

- What are you very good at and what do you enjoy doing?
- In your current position, which types of assignments do you most enjoy?
- What do you envision as your career path? What is your ultimate goal? What milestones do you see along the way?

- What education, courses, and/or training will help move you toward your vision and goals?
- How do you like to learn new skills?

And, because with the Net Generation, the supervisor becomes a partner in the achievement of the goals, another question to ask would be "And how can I help you achieve these goals?" The answers to these questions will help shape the scope of the IDP, and the education and training opportunities contained within.

For members of the 2210 community, an additional tool exists to help identify both general and technical competency recommendations by IT Specialist parenthetical titles, enabling users to build personal career progression plans for needed competencies. This tool, the IT Roadmap, is sponsored by the Federal CIO Council and located at http://itroadmap.usalearning.gov.

TRAINING THROUGH WORK-BASED EXPERIENCES

Agencies will want to use a mixture of training tools, applying different technologies where they fit best to create an integrated, flexible learning experience to handle the Net-Geners' need for personalization. In a recent survey of the Net Generation by nGenera Insight, OJT ranked highest as the preferred method of job training, while pure lectures ranked close-to-last, as shown in Figure 8.2. These figures further validate the value that the Net Generation places on customizable, real-time activities.[10]

In addition to using OJT within the organization to learn aspects of one's current job, there are other "hands-on" training opportunities for Net-Gen employees through internal rotational programs to broaden organizational knowledge and skills and external developmental details that may be used to develop a cross-agency perspective. Both types of developmental details are typically 3 to 12 months in duration and usually occur when the individual is at least a GS-11 or equivalent. To be fully effective, the expectations of the rotational assignment or developmental detail and the responsibilities of both supervisors and participants must be clearly articulated in writing.

Gartner, a leading IT research and advisory firm, states that as part of each organization's effort to build bench strength performance, managers should provide IT employees with "OJT, the opportunity to work with new technologies and information, involvement in leading innovation, exposure to business and senior leaders, and the opportunity to work closely with other IT functions."[11]

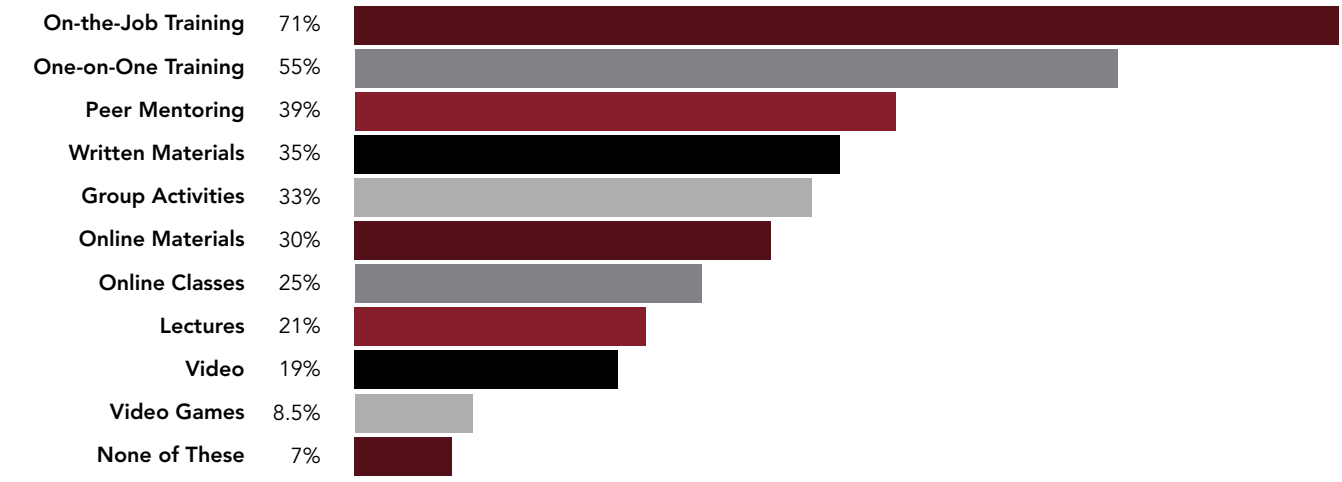


Figure 8.2 Net-Gen View of Which Activites Provide Most Effective Training for Their Job (Source: 2008 nGenera Insight Survey)

Mentor Benefits

1. Renews their enthusiasm for the role of expert.
2. Provides better understanding of barriers experienced by more junior individuals.
3. Enhances skills in coaching, counseling, listening, and modeling.
4. Provides practice in a more personal style of leadership.
5. Enables them to demonstrate expertise and share knowledge.
6. Increases generational awareness.

Protege Benefits

1. Enhances professional development.
2. Increases career networks and enables greater agency exposure.
3. Gains capacity to translate values and strategies into productive actions.
4. Develops new or different perspectives.
5. Obtains assistance with ideas.
6. Solidifies strengths and explores potential.

Table 8.2 Benefits of Traditional Mentoring
(Source: U.S. Office of Personnel Management)

MENTORING

Mentoring provides another opportunity for one-on-one training for the Net Generation through more personal, relationship-building activity. Participating in a traditional mentoring relationship, which usually entails a senior person mentoring a junior, can greatly benefit both parties, as shown in Table 8.2.[12] A more non-traditional mentoring relationship is developed in reverse mentoring, where a junior mentors a senior. This type of mentoring can be quite effective and is gaining in awareness as the Net Generation enters the workforce. Many of them possess greater IT knowledge and can outperform more senior generations in IT skills. Creating opportunities for them to share this knowledge within an agency can provide significant benefit to the organization and allows them to showcase their proficiency.

OPM published a guide on mentoring best practices in September 2008. This guide, which serves as a comprehensive source for establishing a new mentoring program or improving a current program, and lists resources for mentoring, can be found at www.opm.gov.

EDUCATION AND TRAINING PROGRAMS

As organizations build their professional development programs, and customize them to meet Net-Geners' desires and occupational requirements, traditional methods of education and training may augmented with the non-traditional. In addition to formal training experiences, this generation may want to attend a virtual or physical conference, download webinars, or shadow a senior manager. Managers will need to work with their Net-Geners to craft training opportunities that meet everyone's needs.

Federal competitive development programs provide opportunities that may be attractive to the Net Generation. These include scholarship programs that lead to degrees, as well as government-sponsored courses and/or certificate programs. Typically such programs are centrally-funded at the federal or agency level, and acceptance into them is earned through a competitive application process. Examples include:

- CIO University
- National Defense University's Information Resources Management College
- OPM Regional Management Development Centers
- Federal Cyber Service: Scholarship for Service
- DoD SMART and Information Assurance Scholarship Programs

Agencies may also have their own competitive programs tailored to meet specific organizational requirements. Methods to fund training opportunities are included in Chapter 10.

DEVELOPING TOMORROW'S TEAM LEADERS

Web 2.0 technology is providing new tools that can foster collaboration, but developing effective team/project leaders is equally important. The challenge is to find individuals who excel at both task-oriented work and building relationships, and who can employ these skills with large groups whose team members may be geographically separated and previously unknown to each other. According to research conducted by Lynda Gratton and Tamara Erickson in "Eight Ways to Build Collaborative Teams," the level of complexity associated with collaborative team tasks is based on the presence of several factors, and any two of them can cause a task to be labeled as complex. These factors include the size of the group, and whether input and agreement is required from 20 or more people; whether the group was formed specifically to complete the task; if the task requires skills outside the group or specialized input from individuals outside the group; the level of pressure associated with achieving the team's end result; the level of uncertainty of events associated to the task; whether success is dependent on understanding the requirements of individuals not in the group; as well as whether the team members are located in two or more geographical areas.[13]

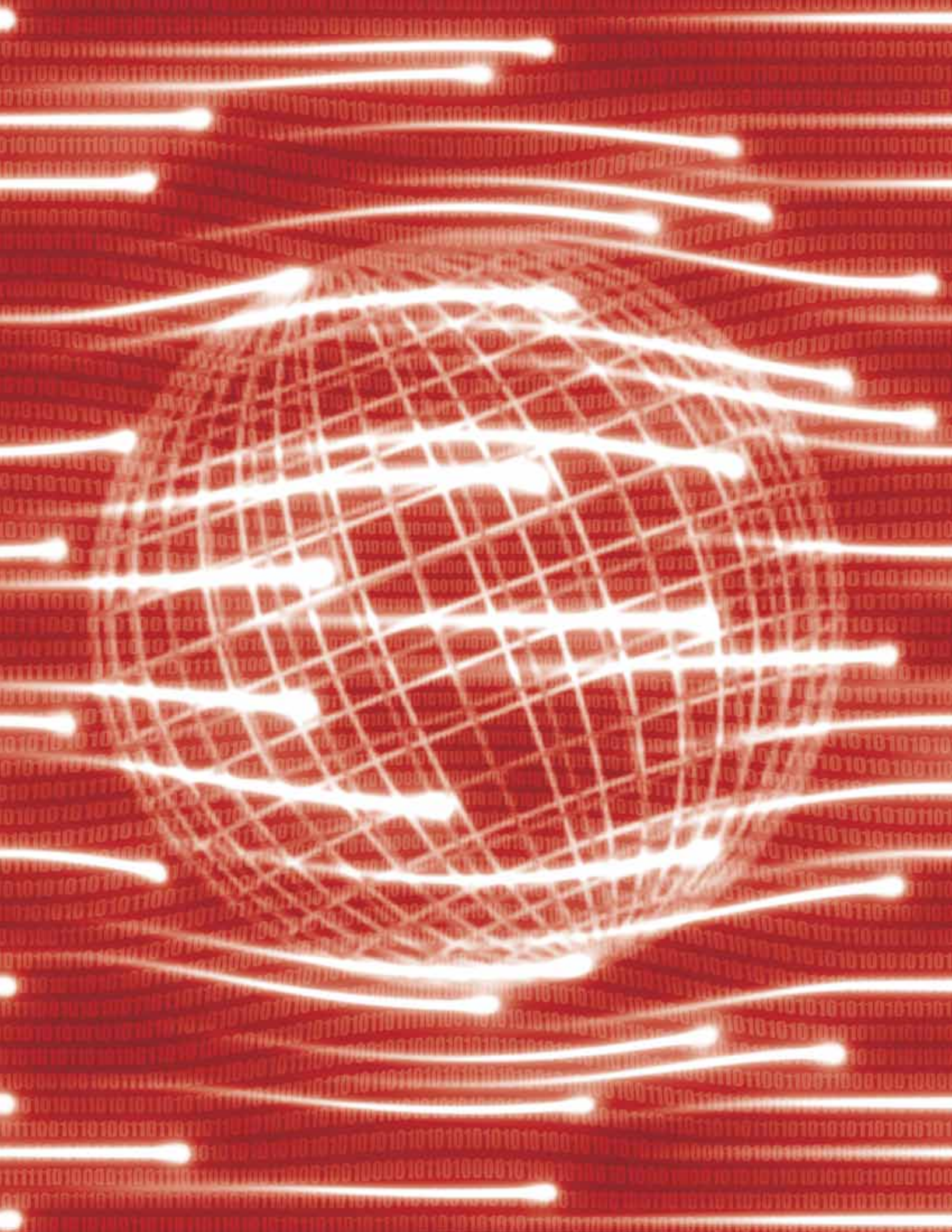
As government organizations develop their leadership succession plans, providing prospective future team leaders with both leadership and project management training will be useful. Another factor influencing potential success will be the previous experience individuals have in collaborative and leadership positions. Traditionally, potential leadership indicators for young entrants to the workforce have included such factors as whether or not they had ever captained a team sport or held an authoritative position in student government. With today's Net-Geners and Gen X, in addition to querying them about school activities, another question to ask may be whether or not they are computer gamers.

For those who are not gamers, the analogy may be hard to follow. Many Boomers might view gaming as a solitary effort between person and machine, with no applicability to leadership aptitude. Those individuals have not been dedicated participants in a Massively Multiplayer Online Role-Playing Game (MMORPG), where a particular computer game, played collaboratively by large groups of individuals who may have never met, continually evolves over time. nGenera Insight and others have researched the skills such players can bring to the workforce as a result of their "virtual training." For serious gamers, who work their way up through the game hierarchy, there are strong skill parallels between managing complex team projects in the workplace and those required to excel as an MMORPG gamer, including strategic planning, resource management, risk management, personnel management, communications, relationship building, and collaboration.[14,15]

…I've been gaming since freshman year in high school. I'm now maxed out, a level 40 at Warhammer. There are about 120 in my guild, which makes it mid-size…I'm the youngest; most are late 20s to 40s. Right now, I'm Vice President, the number 2 person…sure, it definitely builds leadership skills…Being successful at this game means getting to know people, getting to know who they are. We've got players from all over…a lot of West Coasters, a lot of Canadians, a Romanian…four married couples playing together. You're working with people in your own guild, but you're also building alliances with other guilds to get information you need to make strategic decisions. You have to have connections. You need to be able to consolidate sources of information, get the word out to others…I may be talking to 10 people at a time, texting, emailing, phoning…There's a lot of complex coordination involved....

...My company's name? No, don't use it. I think we're about to pull the plug… we wanted to help companies revision themselves, redesigning their websites, logos, business cards. Great idea…at least I think so…yeah, definitely bad timing with the economy…also, I just started college...probably won't be gaming much either.[16]

ALEX WERRELL, 18, MMORPG GAMER, NET-GEN ENTREPRENEUR, YALE '13



shaping the workplace through web 2.0 technologies

Web 2.0 has ushered in a new era of rapidly expanding content and information sharing capabilities. The collaborative capability achievable today through information technology has the potential to drive scientific discovery, innovation, and the financial bottom line in both the public and private sectors. Over time, Web 2.0 technologies will dramatically change the way organizations work internally and how they interact with their external customer base.

The Net Generation understands intuitively the power of Web 2.0. They are the first cohort of young people to have been immersed in an interactive, hyper-stimulating, digital environment since birth, having "grown up digitally." Sometimes referred to as "digital natives," a term first coined by Marc Prensky in 2001, this generation has used technology for education and entertainment since they were toddlers and, as they got older, began virtually hanging out in cyberspace.[1] The Internet is the nexus that allows them to surf news headlines, query search engines, download music, trade photos, play out elaborate gamer scenarios, collaborate on school projects, IM (instant message), and befriend a large community of peers through social networking sites.

Notebooks, netbooks, cell phones, smartphones, and MP3 players are some of the Net-Geners' personal accessories used to provide both a sense of belonging and a sense of purpose. While today's Baby Boomers may get frustrated when Internet connectivity drops, the deprivation of connectivity to the Internet has a visceral impact on the Net Generation.

THE LONGE DAY

In "The Longest Day," an essay in The Washington Post's Sunday magazine, Dr. Danna Walker, a professor at Ameri can University, chronicled the results of an academic assignment which required her undergraduate students to go 24 hours without electronic connectivity—no internet, no TV, no radio, no music players. The anxiousness captured by her student echoes similar work in a qualitative study done by nGenera Insight where Net-Geners, when given a scenario which stripped them of all communication devices, largely considered themselves "paralyzed and discon nected from the world." [2]

EST

"There was a moment in my day when I felt homeless, I couldn't go home because I knew that would be too tempting. I couldn't be with my friends because that would be too tempting. I had just eaten, so I couldn't just sit in a restaurant all day. I was walking down the street literally with nowhere to go, and I just didn't know what I was going to do." [3]

The continuous online engagement so completely embraced by the Net Generation is starting to permeate across all facets of daily life for all generations. Within Government, the call for greater transparency of information and greater functionality of citizen services will fundamentally change the way the Government does business externally. The challenge will be to also transform the way each federal organization functions internally, including how they recruit new employees and serve current employees, how they deploy technology and who gets first access to new technology, and finally, how they govern the use of social media in the workplace.

THE VALUE PROPOSITION FOR WEB 2.0 SOCIAL MEDIA

Social media has the ability to expand network circles from people with strong ties to an individual (family, close friends, and immediate co-workers) to individuals which sociologist Mark Granovetter refers to as "weak ties," who have less immediate affiliation, but have the potential for rich collaboration.[4] Researchers have demonstrated that innovation is largely a learned behavior.[5] Therefore, fostering capabilities which can stimulate learning and sharing, has the possibility to enhance creativity and problem-solving abilities. Hal Gregersen, a noted professor and author specializing in leading strategic change, states that the larger and more diverse the circle of contacts, the better, since meeting individuals from different industries and organizations, with different levels of expertise, creates more potential for innovation.[6]

The Net Generation already understands the importance of networking. Research from nGenera Insight, highlighted in Figure 9.1, demonstrates that they have a larger professional network than other generational counterparts.[7] About one third of the people in their professional network are outside of their organization and they are more likely than the Gen X and Boomers to say that their network includes individuals whom they rarely see in person.[8]

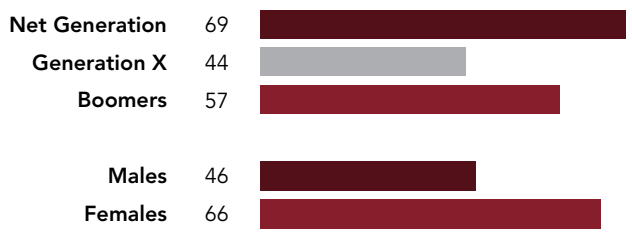


Figure 9.1 Number of People in Your Professional Network (Source: 2008 nGenera Insight Survey)

THE FEDERAL GOVERNMENT'S USE OF WEB 2.0 SOCIAL MEDIA

Many agencies are significantly increasing their use of Web 2.0 social media applications to help do the work of the Government both internally and externally with customers. New applications are continually evolving as both individuals and agencies see the payback from Web 2.0 technologies. Examples of agency use of social media include:

Blogs and Micro-blogs - Robert Carey, the CIO for the Department of Navy was one of the first government officials and the first federal CIO, to have a public blog. When Carey, a reservist, was deployed to Iraq he saw young warfighters using these Web applications and saw their potential in the workplace. Carey has been an advocate of Web 2.0 technologies and uses them to solicit ideas and connect with Navy personnel. Several CIOs within the National Aeronautics and Space Administration (NASA) have also launched blogs in the last year to encourage employees to use this emerging technology as a way to share information and solicit feedback.

Many federal agencies are also using blogs to improve transparency and interaction with customers. The Transportation Security Administration (TSA) launched a blog in January 2008 as way to provide its flying customers a window on TSA policy formulation and to solicit feedback on its procedures. The Department of Defense leadership uses a blog to discuss the future of the Military Health System, and the U.S. National Archives has launched NARAtions to discuss the future of online public access to national records. A detailed listing of blogs created by federal agencies can be found at www.usa.gov.

Wikis - Wikis are being used across the Government as digital meeting places where federal users can share information, create, and collaborate. The extensive search capabilities of these tools allow users to retrieve information regardless of the wiki organization. Additionally, these tools allow people to collaborate on documents much more efficiently than emailing revised versions of documents as attachments. The software is simpler to use because it features both groupware and word processing programs. Version control becomes much simpler as well, enabling the ability to quickly locate the latest document version, with all changes attributed to the proper author.

Intellipedia, a highly successful wiki, is used by the federal intelligence community (IC) and has resulted in increased collaboration and knowledge sharing across 16 IC agencies and other security-related Departments. The DoD has also launched a wiki called DoDTechipe-

dia to improve collaboration on technological solutions among agency scientists, engineers, acquisition workers and operational warfighters. At a federal-wide level, the Office of Management and Budget's wiki at max.gov has been used not only to streamline routine budget processes and facilitate federal budgeting efficiencies, but also to enable federal collaboration throughout a variety of communities. Most recently, the Smithsonian Institution creatied a public facing wiki at http://smithsonian-webstrategy.wikispaces.com to invite public collaboration to transform the organization's digital presence on the Web.

Mashups - Currently, most mashups using federal government data are being created by organizations outside of government. As more government data becomes available, the use of mashups is expected to increase, creating greater transparency and innovative uses of federally available data.

Virtual Worlds - Some agencies are exploring the use of a simulated 3-D virtual world where individuals use avatars to collaborate, learn or entertain, and interact with others. Examples of how the Federal Government has used virtual worlds are: 1) information delivery (NASA, National Oceanic and Atmospheric Administration, Centers for Disease Control and Prevention (CDC), and the U.S. Air Force and Army); 2) education and training (Department of Homeland Security (DHS), and the U.S. Army, Marines, and Air Force); 3) meetings and events (Information Resources Management College, DHS, and the U.S. Department of State); and 4) rapid prototyping (U.S. Navy).

The Information Resources Management College at the National Defense University has hosted several conferences in a virtual world, which has allowed people to connect from all over the world. NASA's virtual CoLab (a web-based collaborative environment) is a dedicated "island" in the virtual world, Second Life, and was established to foster collaboration between NASA and individuals who support the space program.

Other federal organizations are using virtual world technology to train internally or to shape consumer behavior. The U.S. Army has used virtual world technology with America's Army, a 3-D video game used for recruiting and training that allows participants to engage in military maneuvers. The CDC educated the public about the flu by releasing a virtual influenza virus at a virtual children's party to demonstrate the importance of getting vaccinated. Subsequently, more than 20,000 individuals were vaccinated in a six-week period.

Text Messaging/Instant Messaging - Instant messaging or IM, can increase the speed of communication in the workplace by circumventing the formality and structured handling of email. At the Department of Defense, some defense organizations allow instant messaging to be available to their employees so they can have quick chats and collaborate with their colleagues.

Social Networking Sites - The popularity of social networking sites has grown exponentially throughout the world. It is not surprising that young government employees are often leading the way in using them within their federal agency. Steve Ressler, a former IT specialist at the Department of Homeland Security, founded Young Government Leaders (YGL), a group formed to educate, inspire, and transform current and future leaders of the Federal Government. He created the YGL website and its Facebook and LinkedIn groups, and also launched GovLoop.com, a social networking site for government employees to connect and collaborate. In its first year online, GovLoop attracted almost 15,000 members and has since grown another 10,000 in membership.

The first wave of government organizations using Facebook included the Central Intelligence Agency and the Internal Revenue Service, while some organizations like NASA-Goddard Space Flight, have launched their own social networking tools. NASA's tool, SpaceBook, has a broad of capabilities, allowing each Goddard employee the ability to find subject matter experts, form online groups with whom to share files and create wikis, and even locate or dispose of surplus gear. The use of social networking sites by government entities will increase as agencies determine appropriate applications for them and provide employees guidance on site usage.

CHALLENGES IN IMPLEMENTING WEB 2.0 TECHNOLOGIES

The Federal Government has made significant advancements but still faces several challenges when it comes to the adoption of Web 2.0 technologies. By nature, the Government does not quickly adapt to new tools, particularly when it comes to incorporating new technologies in the workplace. Although the role of IT managers is to figure out how to provide those technologies for employees, a larger governance group may be used to develop guidance on their usage, including legal, privacy, public relations, and human resources specialists. The DoD, which published new policy guidance, DTM 09-026, "Responsible and Effective Use of Internet-based Capabilities," (including social networking services) in February 2010, gave the greater defense community, as well as outside organizations and individuals, a voice in developing the policy by using a blog and open, collaborative technology to solicit input.

The Social Media Subcouncil, operating under the Federal Web Managers Council, and comprised of federal,

state, and local government web managers, maintains an excellent wiki with best practices and a wide array of published policies on social media use. Additionally, they can be found blogging on GovLoop.com.

Record retention is another challenge for agencies, as many Web 2.0 tools do not lend themselves to easy archiving of data. Security issues also rank as a top concern, and many security challenges will need to be resolved as these technologies are adopted federal-wide. Some government agencies have found it necessary to limit or prohibit connectivity to nongovernmental channels based on the grounds of security. While there are legitimate concerns about data protection, organizations must find solutions that protect their IT systems while simultaneously allowing consumers full access to emerging social media technologies.

Beyond the legal and security concerns, are the more practical issues involved with successful implementation of new media within an organization. Many of these can be addressed by understanding the function each type of social media might play. Andrew McAfee, a researcher, writer, and teacher about technology's impact on the business world, suggests that wikis may work best for organizations with strong ties that are intent on producing a collaborative product; blogs can help cultivate potential new ties; and social networking sites may be best suited to cultivating weak tie relationships to facilitate innovation.[9] Further, depending on the organization, the right answer might be to not build a community. If an organization does not have leadership support, or does not have the time and talent necessary to devote to the tending of relationships generated through social media, the project is ripe for failure.[10]

The U.S. Department of State, which is embracing a wide variety of social media to foster diplomacy abroad, noted in a case study on digital diplomacy that it was essential to provide both technical and professional training to individuals charged with representing the organization online; that outside experts in social media can be helpful in crafting the message to be conveyed and the social engagement desired; and that governance policies on information dissemination (and how creatively it can be conveyed) should be developed.[11]

By contrast, the NATO Training Mission-Afghanistan (NTM-A), charged with a time-critical, targeted effort to tell the world about NATO support efforts in Afghanistan, employed the services of a U.S. Marine Corps colonel and two U.S. Net-Gen Navy petty officers, a budget of $500, and various social media tools including Facebook, YouTube, Flickr and Twitter, to enrich a homegrown website that allows NTM-A personnel to tell the world, in their own words, about their experiences in Afghanistan.

WEB 2.0 WORKPLACE AND BEYOND

The transformation of the workplace is just beginning. The power of transactional sites such as Amazon and eBay, the search engine capabilities of Google, Yahoo, and Microsoft's Bing, and the explosion in social networking sites such as Facebook and MySpace, have revolutionized the lives of private consumers. It is not beyond the Government to accomplish the same capabilities within the public sector. Creating a workplace that fully utilizes Net Generation talents can be a first step to the future.

The workplace of the future will be radically different from today's preconceived workplace that involves hard-wired equipment, multiple cubicles, and 9 to 5 workdays. The future promises more flexibility, more mobility, and more independence, while at the same time, helping employers to get the most out of every employee. Web 2.0 tools are already helping to create a seamless work environment where employees can easily transition from one task to another without having to move from one tool to another. Additionally, they will create a level of transparency that affords employees an opportunity to view the work of others and makes employees more accountable.

Changing technology will allow this future workplace to become a reality sooner than most people realize. Many companies are already using virtual teleconferences, virtual worlds, and other technologies to quickly connect employees from all over the globe, allowing employees to work together with their peers in real time, while being in different locations. Eventually, holograms could be used to allow employees in different locations to chat face-to-face. Even the offices themselves will be modified. As people shift towards working from home, conference rooms may eventually outnumber cubicles in the office, serving as meeting grounds for employees as needed.

The future workplace has often been seen as a dream working environment, offering maximum freedom, where employers allow their employees to choose when, where, and how they work. More than most, the Net Generation sees this workplace not as a dream, but as a goal, fully realizable. As they continue to expand their presence in the workplace, expect many more changes within the federal IT workforce.

Social media challenges some of the fundamental paradigms organizations have about control in terms of message content, how and where it spreads, and the outcomes of those actions. By design, with social media the messenger's voice can't be easily controlled or predicted. Consequently the challenge in adopting social media for many organizations is more cultural than operational.[12]

DR. MARGARET SCHWEER AND RICHARD LAUF

"THE NEW SOCIAL MEDIA MINDSET: ORGANIZATIONAL PRINCIPLES AND GOVERNANCE PROCESSES"

workforce compensation, benefits, and flexibilities

Creating an attractive compensation and benefits environment can be challenging. It requires good marketing and the ability to deliver the goods marketed. Additionally, it requires knowledge of the job market and the ability to maneuver within a complex, bureaucratic compensation system that is continually changing. While federal agencies have an array of flexibilities that can be used in the recruitment and retention of Net Generation individuals, most organizations do not use them in a wide scale, strategic application. A major factor is often a lack of funding, as cited in both 2007 and 2008 surveys of federal Chief Human Capital Officers.[1,2] This lack of resources, coupled with a lack of systematic planning and targeted application within most agencies, dilutes the effectiveness of these federal-wide flexibilities.

The list of flexibilities contained in this Chapter is not meant to be all-inclusive, but to highlight those flexibilities that may be particularly attractive to the Net-Gen. The Office of Personnel Management (OPM) continues to work on new flexibilities to address the Federal Government's recruiting, retention, and professional development requirements.

BASIC SALARY EXPECTATIONS

In the 18th Annual Survey of Federal CIOs, conducted by the Information Technology Association of America, CIOs expressed their concern regarding their ability to offer competitive pay and benefits.[3] There is merit to this concern. Although 4 of the 5 series in the Major Federal IT Community have special salary rates for personnel under the General Schedule, their value has been eroding over time as locality pay increases cause these rates to outstrip the special salary rates. Hiring managers should compare the two rates for their geographical area and where needed, determine the feasibility of offering new Net-Gen hires with exceptional credentials an increased salary step when market conditions warrant it. Additionally, when possible, managers might create laddered positions for new hires.

TANGIBLE AND INTANGIBLE BENEFITS

Money does matter to the Net Generation and being net-savvy they can, through a combination of surfing official sites and mining social networking capabilities, determine quite accurately the salaries being paid for individuals in their work field. Where they may fall short is in estimating their worth to a company, particularly as a new entrant to the workforce. Human Resource managers have stated that the youngest generation may have unrealistic expectations of starting salaries. In January 2009 the Partnership for Public Service and Universum reported a $7,000 gap between students' anticipated starting salary in the Federal Government and the 2008 starting range for a GS-7.[4]

Federal employee salaries, while often lower than their private industry counterparts', are only one part of the employment compensation package. The Partnership for Public Service recommends that organizations should discuss both agency benefits and federal-wide service benefits (summarized in Table 10.1).[5] Further, they should understand that their audience in the benefits discussion is not only the prospective Net-Gen applicant, but may be the applicant's parents as well. In a 2008 nGenera Insight survey, 24% of Net-Geners said that their parents' advice was critical when deciding to accept a job offer.[6] Parents were also involved in their finding their first job after college. as show in Figure 10.1.[7]

As benefits are discussed, it would be important to remember that the Net Generation wants customizable options. Thus, different benefits and opportunities may appeal to each applicant. In a survey conducted by the Gallup Organization for the Council on Excellence in Government, 52% of Net-Geners (aged 18 to 29) said the best motivators for them to consider a job in public service would be opportunities for growth and advancement based on performance; 41% were very interested in having a flexible schedule and telework opportunities; 27% were interested in enrollment in a student loan repayment program; and 26% were interested in access to continuing education.[8]

RECRUITMENT AUTHORITIES

Recruitment Bonuses - Agencies may pay recruitment bonuses to newly appointed federal employees in hard-to-fill positions in exchange for a signed service agreement. The amount of the bonus may range up to 25% of the new employee's annual rate of pay (or more, with OPM approval), multiplied by the number of years in the agreed service period (which can range between 6 months to 4 years). Payment of the bonus can be in a lump sum, phased installment or other installment plan, as designated by the agency. Organizations must have a pre-established recruitment incentive plan in order to offer a bonus. In FY2007, 5,658 GS federal employees received recruitment bonuses; over half of the recipients were GS-9 or below.[9] Appendix G provides a breakdown of IT workforce recruitment bonus payments by Federal CIO Council membership.

Direct-Hire Authority - Direct-hire authority is designed to provide agencies flexibility to recruit individuals for career-conditional appointments to positions in shortage or critical shortage occupations. In 2003, OPM authorized federal-wide direct hire for the 2210 series IT Specialists, GS-9 and above, in Information Security. Individuals recruited to this specialty area may be appointed to positions without regard to the requirements in title 5 USC 3309 through 3318.

Fellowships, Scholarships, and Similar Programs Authorities - The fellowships, scholarships, and similar programs authority at 5 CFR 213.3102(r) provides an excepted service appointing authority for filling positions from limited applicant pools under hiring and operating procedures established between a federal agency and a non-federal organization. Although appointments are time-limited (cannot exceed four years) with no conversion privilege to the competitive service, this authority allows agencies to:

- Bring in individuals with specialized knowledge or expertise under agency-developed exchange programs with the private sector.

* Survey participants were asked to select which two motivators would make them most interested in a public service job.

Figure 10.1 Parental Involvement in Finding First Job After Finishing Education (Source: 2008 nGenera Insight Survey)

- Provide a means for individuals to meet a service obligation under specific programs authorized in statute.
- Provide students insight and the opportunity to apply their particular field of study to real-world situations.
- Support internship or fellowship programs that provide developmental or professional experiences to individuals who have completed their formal education.
- Establish training and associate programs to increase the pool of qualified candidates in a particular occupational specialty.
- Design professional/industry exchange programs that provide cross-fertilization between the agency and the private sector to foster mutual understanding and exchange of ideas and/or to bring experienced practitioners to the agency.
- Arrange residency programs through which participants gain experience in the federal environment.
- Participate in programs that require a period of government service in exchange for educational, financial, or other assistance such as the Federal Cyber Service: Scholarship for Service program.

Student Career Experience Program (SCEP) - The SCEP allows appointment of students to positions that are related to their academic field of study. Employment as a student is in the excepted service and public notice is not required. Participants who meet all the requirements of the program may be noncompetitively converted to term, career, or career-conditional appointments. SCEP can be used as a tool to grow the IT workforce by hiring students into developmental positions to address future agency needs. To participate in SCEP, a student must be enrolled or accepted for enrollment as a degree-seeking student in an accredited high school; technical or vocational school; two-year or four-year college or university; or graduate or professional school. All students must be at least 16 years old.

FEDERAL SERVICE BENEFITS

- **INTERESTING AND CHALLENGING WORK**

  Addressing national issues

  Safeguarding critical information and IT infrastructure

  Collaboration with private industry, professional organizations and other governmental organizations

  Insight into how government works

  Meaningful public service

- **GUARANTEED RIGHT TO ELIGIBLE BENEFITS**

  Transportation subsidies

  Extensive health care and insurance benefits

  Ample vacation/sick leave

  401K Plan

- **FEDERAL-WIDE JOB OPPORTUNITIES**

  Federal IT jobs nation-wide and overseas

  Significant opportunity for advancement and professional growth

  Experience valued: on average, transferring employees within the federal IT community make more money than new hires

  Personnel details may be available to other agencies

- **FEDERAL PROFESSIONAL DEVELOPMENT**

  Professional journals, Communities of Interest, other publications

  Conferences and webinars

  Associations

- **AND MORE**

  Job security

  Flexible work arrangements

  Student loan forgiveness after 10 years of employment

Table 10.1
Federal Benefits to Discuss with Prospective Employees (Source: Partnership for Public Service)

Federal Career Intern Program (FCIP) - The FCIP is designed to help agencies recruit exceptional individuals into a variety of occupations at the GS-5, 7, and 9 grade levels. Agencies can strategically target entry-level positions and create a pipeline of talent that ultimately leads to a journey-level position in the agency.

Individuals are appointed to a two-year internship that provides formal training and developmental assignments as established by the agency. Upon successful completion of the program, interns may be eligible for non-competitive, permanent placement within the agency.

Individuals with diverse professional experiences, academic backgrounds, and/or relevant skills are eligible for the FCIP. The program is not restricted to students and career intern appointments may be made at any time during the year.

Many agencies use the FCIP to identify suitable candidates for their agencies, including the General Services Administration (GSA), Social Security Administration (SSA) and the Missile Defense Agency (MDA) who have highly successful FCIP initiatives. Additionally, several federal agencies have independently established structured development programs including the Emerging Leaders Program at the Department of Health and Human Services; the Professional Development Program at the U.S. Government Accountability Office and the Army Knowledge Leaders (AKL) program at the Department of the Army.

- GSA in Kansas City, Missouri, has been using FCIP to fill positions at the GS-5, 7, and 9 levels in numerous fields since 2002. An Individual Development Plan is prepared for each intern who works with a panel to ensure that the intern meets specific professional goals.

- FCIP has been used successfully at the SSA in its recruitment of Claims Representatives. Applicants are identified through other external recruitment initiatives such as job fairs, community outreach activities, or paid advertising. SSA has found that liberal arts graduates do very well at most entry-level positions and attributes its success in building a large and diverse workforce to a balanced and targeted use of the hiring authorities available. Additionally, it establishes relationships with students and college staff, maintaining strong on-campus relationships.

- The MDA used FCIP when faced with a large cohort of senior GS-14/15s who were retirement-eligible as well as a lack of entry-level people in its workforce. High-demand occupations such as engineers and accountants were targeted at schools that would produce the best candidates. In addition, MDA used career fairs, the National Association of Colleges and Employees (NACE), and Call to Serve* as ways to get exposure for its mission and hiring requirements. MDA focused on finding the right fit by making sure the job details were clear, conducting thorough interviews, and assessing behavioral as well as technical competencies.

- In 2003, the Department of the Army used the FCIP authority to implement an AKL program to attract high-achievement university graduates to serve as Army IT civilians. The AKL is an ongoing, structured two-year program, with four cycles of leadership training and developmental assignments at different Army, defense, or other federal locations. The AKL interns learn leadership, business management and IT skills while developing a robust peer network, and receiving career ladder promotions ranging from GS-7 to GS-12 during their internship period.

Presidential Management Fellowships - The Presidential Management Fellows (PMF) program (or similar type program) has been in existence for over 20 years. In recent years, the program has expanded in scope to enable graduate level students in all academic disciplines to apply for a fellowship within the Federal Government. This program can be an outstanding method to attract new Net-Gen talent to IT policy management positions within the Federal Government at the GS-9 to GS-12 (or equivalent) levels.

Each year, OPM prescreens all PMF applicants, selects the finalists, and prequalifies them for at least a GS-9 position. Although finalists are available for hire throughout the year, OPM also sponsors an annual job fair in Washington, D.C. each spring where agencies can meet multiple candidates.

Agencies using the PMF program hire suitable fellowship candidates for a two-year period during which they complete Individual Development Plans that include both formalized training and developmental and rotational assignments. Successful participants may later be converted to permanent, full-time employment within the participating agency.

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* Call to Serve is a national initiative created by the Partnership for Public Service to educate a new generation about the importance of a strong civil service, to help re-establish links between federal agencies and campuses, and to provide students with information about the opportunities that Federal employment provides.

Federal Scholarship Programs **-** The Federal Government has several scholarship programs suitable for recruiting and retaining IT personnel. These programs provide academic funding in exchange for government service. These include:

- ***Federal Cyber Service: Scholarship for Service (SFS)*** **–** The SFS is a federal-wide scholarship program, co-sponsored by the National Science Foundation (NSF) and Department of Homeland Security (DHS). NSF funds the final two years of undergraduate, master's-level, or doctorate-level study in information assurance (IA) academic programs at select colleges and universities throughout the United States. Scholarship recipients must perform a two-year payback at an interested federal organization. Agencies interested in hiring SFS interns or graduating students can attend the annual job fair held each January in Washington, D.C., where approximately 100 individuals are available for hire as IT professionals.

- ***Information Assurance Scholarship Program (IASP)*** **–** The IASP is used to increase the number of individuals in DoD who possess key IA and IT skill sets. It serves as a mechanism to build the nation's IA infrastructure through grants to colleges and universities jointly designated by the National Security Agency and DHS as National Centers of Academic Excellence in Information Assurance Education or Research, and to develop and retain well-educated military and civilian personnel who support the Department's critical IA and IT management and infrastructure protection requirements. This program serves active duty military, DoD civilians, and non-DoD students, all of whom incur a service payback in exchange for academic scholarships in IT/IA disciplines.

- ***Science, Mathematics And Research for Transformation (SMART)*** **–** The SMART Scholarship for Service Program was established by DoD to support undergraduate and graduate students pursuing degrees in Science, Technology, Engineering and Mathematics (STEM) disciplines. The program aims to increase the number of civilian scientists and engineers working in DoD laboratories. This program is open to current DoD employees and non-DoD students. All recipients incur a service payback in exchange for full scholarships.

- ***U.S. Department of Agriculture (USDA)/1890 National Scholars Program*** **–** Each year, USDA provides full four-year scholarships to high school students to attend any of the 17 Historically Black 1890 Land Grant Institutions or Tuskegee University. Scholars must major in agriculture-related fields, food or natural sciences, or other applied disciplines such as computer science, pre-veterinary medicine, or biological sciences. Thirty-six or more scholarships are awarded annually and graduates perform payback service with USDA for each year of financial support.

FEDERAL STUDENT LOAN REPAYMENT PROGRAM

Paying down educational debt in return for an employment commitment can be a viable way to attract the Net Generation to certain career fields. Currently, there are five major occupational avenues individuals can pursue that have student loan repayment recruitment benefits: teachers, national volunteer programs such as the Peace Corps and VISTA, health professions, military service, or working as a civilian employee for the Federal Government. At a Net Generation conference in February 2008, hosted by New Paradigm, pay and benefits specialists speculated that a new trend in private industry student loan repayment programs might develop as the business world begins to compete for Net Generation workers.

During 2007-2008, graduates amassed an average educational debt of $23,186 for undergraduate degrees and $40,297 for graduate degrees.[10] Almost two-thirds of undergraduates and over half of grad school graduates incur educational debt, and the debt burden does not end there.[11] Unlike when the Baby Boomers went to college, Net-Geners have had more ready access to consumer credit. According to Anya Kamenetz, author of "Generation Debt," Nellie Mae reported that in 2004, in addition to incurring student loan debt, undergraduates carried at least $2,100 in credit card debt while graduate students had an average of almost $8,000 in debt.[12] Student credit card debt may decline over time, as a result of recent credit reform legislation.

The current federal tool, which is very flexible, allows agencies to tailor the program to meet individual needs:

- The maximum annual payment is $10,000 with a six-year maximum offering.
- The minimum payback period is 3 years of federal service and an agency can specify a longer required payback period.
- The student loan repayment program can be used as a recruitment or retention incentive and also may be offered in conjunction with recruitment, retention, or relocation bonuses.
- There are no mandatory academic program criteria and students are not required to have completed a degree or certificate/certification to be eligible.
- The program may be tailored to a specific occupation/skill.

Federal agencies provided student loan repayment benefits to 6,879 employees in calendar year 2008, with an average annual loan of almost $7,511.[13] Departments and agencies who are members of the Federal CIO Council provided loan repayment benefits to 88% of total federal benefit recipients; however, only 6% of those recipients were members of the Major Federal IT Community. Appendix G provides a breakdown of IT workforce loan repayment benefits by Federal CIO Council membership.

ADDITIONAL ANNUAL LEAVE FOR NEW EMPLOYEES

The majority of Net Generation individuals hired by federal agencies will be new to the Government and may also be new to a structured work environment if they have recently completed an academic degree. Unless these individuals are authorized to participate in an alternative work schedule, their potential for paid days off is limited to 10 structured federal holidays and 13 individual vacation days annually for the first three years of their employment. Increasing annual leave accrual as a recruitment incentive or authorizing time-off as a performance award (discussed in Chapter 7) provides opportunities for additional hours off from work.

The oldest members of the Net Generation have now crested age 30. Those older members, or even younger members, with a particularly strong employment record, have valuable work experience and may be recruited into hard-to-fill or mission critical positions within the Federal Government. Those who are newly-appointed civilian employees, or have had a 90-calendar day break in federal service, can be eligible for a higher annual leave accrual rate based on previous years of work experience, including active duty uniformed service. Use of this authority requires documenting the length and nature of the claimed creditable service and approval by an agency's authorizing official. All written documentation must be approved prior to the individual's effective entry on duty.

RETENTION FLEXIBILITIES

Retaining a Net Generation employee may be more challenging than retaining the older generations as these individuals are still exploring their work identity and their passion for work. Compensation, particularly paying for performance, will be a factor, but the work environment (Chapter 7), professional development opportunities (Chapter 8) and work/life balance (Chapter 11) will factor into Net-Gener decisions as well. nGenera Insight, after studying Net-Gen behavior and stated career goals, has likened Baby Boomer career patterns to the game of Shoots and Ladders, where players go up or down, and Net-Gen career ideas to a Rubik's Cube, with endless combinations.[14]

Rather than create a lockstep retention strategy, organizations should become comfortable in tailoring retention opportunities to meet individual and agency needs. Part of the retention strategy might include an employee enrichment program which allows Net-Gen employees to team on different projects. Another aspect might include designing a program that facilitates moving employees sideways through the organization. Such a program can pay off by retaining individuals in the organization, while not necessarily in the same job.

Many retention flexibilities are tied to professional development/educational programs. The two defense scholarships previously cited, IASP and SMART, and the federal student loan repayment program can also be used as retention incentives. Additionally, several other academic opportunities exist, as described on the next page. Agencies using such programs may require a service payback. Information on all of these authorities may be found at www.opm.gov.

* The OPM Report does not identify how many individuals received this benefit as a retention incentive or as a recruitment incentive, or how many of the 6,879 individuals were new recipients vice prior year awardees.

ACADEMIC PROGRAMS

Payment for Job-Related Academic Degrees - Agencies may pay for or reimburse employees for the cost of academic degree training when it meets certain criteria:

- The training must contribute to meeting a specific agency training or staffing need, or to accomplishing agency strategic goals.
- The training must be part of a planned, systemic and coordinated organizational employee development program which links to accomplishing the agency's strategic goals.
- The academic program must be through an accredited college or university in accordance with U.S. Department of Education accreditation requirements.

Payment for Professional Credentialing - Agencies may pay expenses for employees to obtain professional credentials. This includes expenses for professional accreditation, state-imposed or professional licenses, professional certifications, as well as the examinations to obtain the credentials. This flexibility may be particularly attractive for IT employees and agencies, both of whom can benefit from IT systems and security credentialing programs.

Academic Incentive Programs - Some agencies have developed programs which offer a retention incentive for individuals who complete certain educational endeavors. Two examples are provided by the U.S. Department of State and the Defense Information Systems Agency. The Department of State has an IT Skills Incentive Program which pays qualified IT employees with specific skill codes or in certain IT positions 10% or 15% of their basic pay based on attainment of specific professional IT credentials. The Defense Information Systems Agency pays an incentive of $1,000 to $3,000 for approved professional credentialing aligned to DISA's mission and the employee's IDP, and $1,000 to $5,000 for attainment of academic degrees which meet similar mission and IDP criteria. Both programs require a minimum two-year service agreement.

Shared Cost Academic Programs - Agencies can establish shared cost programs through full or partial tuition reimbursement programs or other shared cost arrangement. The flexibility of when to attend training and how to pay for it may appeal to the Net Generation. Some possible program variations are shown in Table 10.2.[15]

Training and Education Unrelated to an Employee's Official Duties - The Net Generation sees value in pursuing multiple interests and careers. Agencies can support this desire for additional skill development by allowing employees time off to take classes not specifically related to their official duties. The academic studies may not significantly interfere with normal work accomplishment and must enable the employee to work more effectively within the organization.

RETENTION BONUSES

Agencies may pay individual or group retention incentives based on unique qualifications and critical need. Individual retention incentives may not exceed 25% of an employee's rate of basic pay and group or category retention incentives may not exceed 10% of the employee's rate of basic pay, although higher awards may be allowed with OPM approval. Awards may be paid in installments or a single lump sum after completion of the required period of service. Within the GS schedule, retention bonuses are more typically paid to GS-10 and above; only 42% of federal recipients in calendar year 2007 were GS-9 or below.[16] Appendix G provides a breakdown of IT workforce retention bonus payments by Federal CIO Council membership.

Paying Training Costs	Training On Duty/Off Duty Hours
Agency Pays the Costs of Training.	Employee Attends During Duty/Non-Duty Hours.
Agency Pays Some of the Training Costs, Employee Pays the Balance.	Employee Attends During Duty/Non-Duty Hours.
Employee Pays All the Training Costs.	Employee Attends During Duty Hours.
Employee Pays All the Training Costs, Agency Reimburses Part or All of Costs When Course is Successfully Completed.	Employee Attends During Duty/Non-Duty Hours.

Table 10.2 Agency/Employee Shared Training Cost Examples (Source: U.S. Office of Personnel Management)

work and life balance

Research has consistently shown that the Net-Geners seek flexibility and a balance between their personal and professional life. Rather than "work/life balance," Net-Geners see the world as needing "life/work balance." They do not simply define themselves by where they work and what they do; that is just part of who they are.[1] They tend to cultivate interests in many areas and their life roles are changing as well, with household responsibilities being more equally divided between the genders.[2] Work is also becoming less compartmentalized. As discussed in Chapters 5 and 10, the lines between work and non-work activity are becoming blurred. This has import on the Net-Geners' need to have a work environment that is engaging, collaborative, and fun.

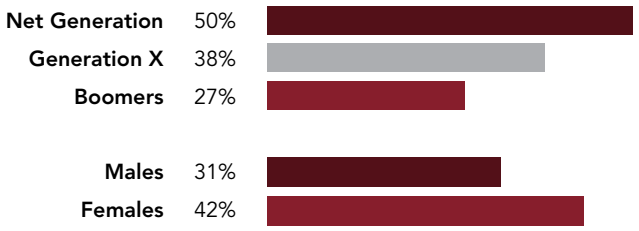

Figure 11.1 Criticality of Flexible Work Hours to Accepting a Job (Source: 2008 nGenera Insight Survey)

In 2005, Best Buy instituted an innovative work process that allowed employees at its corporate headquarters to work without a formal work schedule. The results, as studied by the University of Minnesota Flexible Work and Well Being Center, included improved work-family interface, improved health practices (more sleep, exercise, and energy), a greater intention to stay with the company and more job satisfaction.[6] Best Buy itself noted that productivity among participants increased by more than 30%.[7]

FLEXIBLE WORKING HOURS

In a recent survey conducted by nGenera Insight, half of the Net Generation respondents felt that the availability of flexible work hours was critical when deciding to accept a job offer, as shown in Figure 11.1.[3] Although this generation may be the most vocal about work/life balance, other workers are feeling an increased need for flexibility and work/life balance as well.

The increased number of women in the workplace has driven the need for more flexibility for family requirements. According to HR Review, almost two thirds of families with preschool children have mothers working outside the home; if a child is sick, most often it is the mother who is called at the workplace.[4] There is also a growing demand for flexibility from employees needing time to take care of their own parents, as well as those sandwiched caretakers with generational care responsibilities at both ends of the spectrum. The Labor Project for Working Families conducted a survey in 2002 and found that 40% of family members caring for their parents and grandparents also had child-care responsibilities.[5]

Taken to its extreme, flexible work hours would mean allowing Net-Geners (and others) to take complete charge of their own work schedule, working wherever and whenever, as long as they delivered high quality results on time. While private industry is taking experimental steps in this direction, less than half of private companies currently offer any type of flexible work schedules. Thus, the Federal Government, with its authority to offer flexible schedules and telework, can be competitive in this work/life area. Currently, the Federal Government has four flexible work programs:

- ***Flexible Work Schedules*** - Allows the employees to have a set work week, however, the reporting and departing times could fluctuate day-to-day.
- ***Compressed Work Schedules*** - Allows working a schedule which consists of less than 10 workdays per pay period. Generally, the employee would work 9 or 10 hours a day.
- ***Flexitour*** - Allows employees to schedule specific work hours based upon their personal circumstances.
- ***Credit Hours*** - Used in lieu of paying overtime and more so used as compensatory time.

The application of these flexibilities may vary from agency to agency, but those who allow flexible schedules can enhance their organization's attractiveness to prospective Net-Gen employees. Additionally, although some opportunity may exist for job sharing in individual agencies, the focus of this guide is on the full-time Net-Gen employees. Agencies should not underestimate the value of flexible work schedules to new government employees. As shown in Figure 11.2, working a compressed schedule potentially triples the paid time off a Net-Gen employee, new to government service, can earn.

FLEXIBLE WORKPLACE

Based upon improvements in technology and the digitalization of the work environment, employees no longer need to be physically situated in a traditional office during core working hours. Technology devices such as cellular phones, blackberries and other wireless devices allow employees the ability to work anywhere and anytime. While no one expects government employees will be authorized to text their work in from the ski slopes any time soon, even teleworking, the most structured version of a flexible workplace, has not caught on as much as it should within the Federal Government. In its most recent report to Congress on teleworking, the Office of Personnel Management (OPM) reported that for 2007, the number of federal teleworkers as a whole was down (with some of the decline attributed to better data collection and some due to the Department of Defense's continued wartime support and security concerns).[8] Only 8% of eligible personnel were teleworking across the Federal Government.[9] The top three barriers to telework cited by agencies were office coverage, management resistance, and organizational culture.[10]

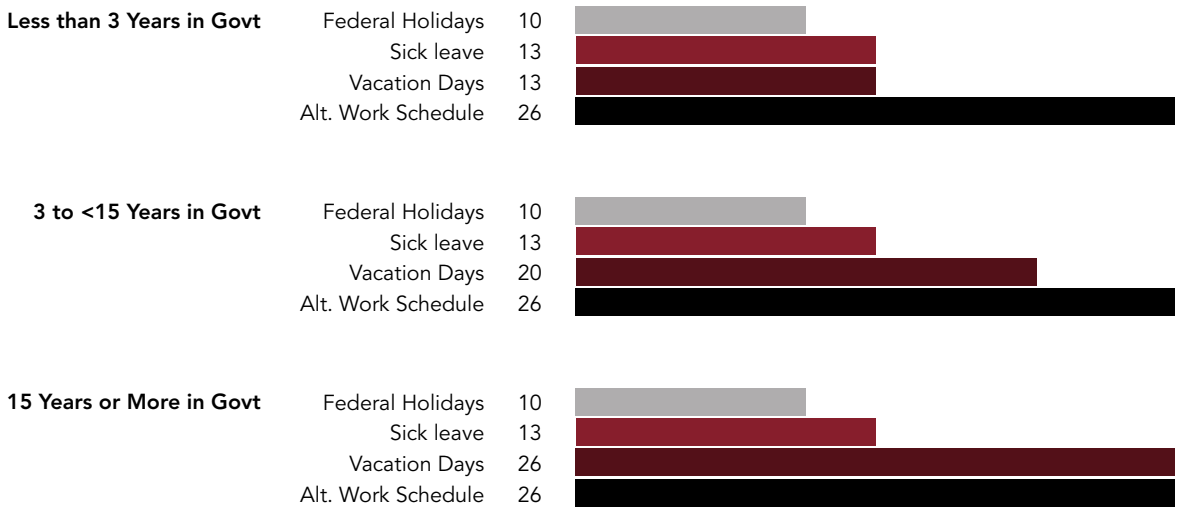

Figure 11.2 Federal Employee Days Off Based on Service Longevity in the Federal Government

Ultimately, managers will determine whether an employee's duties can be performed outside the traditional work environment. However, if the manager promotes a more flexible and supportive work environment, more employees, particularly Net-Geners may be recruited and retained. A 2008 report from the Telework Exchange (www.teleworkexchange.com), a public-private partnership focused on telework in government, cited the two top drivers for federal workers to telework were reduced commuting time/costs and work/life balance.[11] nGenera Insight also states that environmental issues are a key concern to Net-Geners who may want to telework.[12]

Organizations should review the federal website, www.telework.gov, which addresses how to set up a telework program and provides training for both managers and employees on how to make the program work effectively. Additionally, they need to examine why barriers may exist within their organization. Understandably, managers may have concerns about information security, connectivity, and suitable infrastructure, however, these are challenges that can be addressed and generally, should not hinder an organization's ability to establish a telework program.

Many agencies have successful established a telework program. Some standout agencies cited by OPM in its 2008 telework report included the Peace Corps and the Department of Health and Human Services and the General Services Administration gets high marks through surveys conducted by the Telework Exchange.[13] The DoD's Contract Management Agency (DCMA) has successfuly established a telework program that allows many of their employees to work remotely and reduced office footage while the U.S. Patent and Trade Office's program reduced employee turnover.

The pressure to increase teleworking and compressed work schedule opportunities across the Federal Government will most likely increase, from both employees and the Congress. The Net-Geners will help drive the change by seeking employment at those organizations that allow them flexible work locations and schedules so they can have work/life balance. Congress will be interested in driving to a more efficient government; ensuring continuity of operations during natural disasters, pandemic health crises and other catastrophic unplanned events; and reducing dependence on foreign oil.

FLEXIBLE WORK ENVIRONMENT

Fun in the workplace is not a new concept. Searching online for "fun in the workplace" yielded over five million results and surveys at top-ranked organizations often include statements from employees about their organization being a fun place to work. The difference with the Net Generation is that it is one of their eight norms. They have elevated its importance, largely because they are less likely to compartmentalize work from other aspects of their life.[14] They may want to take a break in the middle of the day to get reinvigorated. They like to learn on the job. And, they are more adept at switching from work to play to work in their task orientation. Creating an environment that enables playfulness, creativity, and collaboration can improve morale, reduce employee absenteeism from the job, and ultimately reduce overall attrition.

With the increasing reliance on information technology in delivering the many missions of the Federal Government – from defending and securing our Nation, to conserving natural resources, and ensuring a strong economy – today's leaders must be focused on developing and recruiting a strong talent pool to operate and manage this complex enterprise. A well-balanced strategy that recognizes and accommodates our generational differences is critical to achieving a high-performing Federal IT workforce. The Net-Geners' experiences, in an on-demand world in which collaborative tools, social media, and instant messaging are ubiquitous and have shaped their norms, will continue to drive their expectations in the workplace. Our agility and adaptability to the changing needs of this and future generations are critical to our success in meeting the challenges faced by the Federal Government.

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conclusion

The federal information technology (IT) environment will be undergoing tremendous change on many levels over the next decade. As the Federal Government transforms agencies into a network of more transparent, citizen-centric organizations, implementing the necessary policies, processes, and secure technology to power the exchange of information and ideas will create tremendous challenges for the federal IT workforce charged with this transformation.

The Net Generation, with its inherently more collaborative and IT-savvy nature, is most likely to embrace the changes, which will more closely mirror the way they already prefer to engage with technology and to share information. Currently, this generation is under-represented in the federal IT workforce, particularly within the 2210 series, which is the backbone of the federal IT population. While Net-Geners are more likely to be interested in federal service over their Gen X counterparts, post-recession, they will be in high demand throughout the public and private sectors due to both job growth and pending retirements within the Baby Boomer generation.[1]

A great unknown within the federal IT workforce is how quickly the federal Baby Boomers will retire. The ongoing recession may slow down retirements, but failing to plan for the succession of the current workforce would be a significant weakness in strategic human capital management. Within this guide were discussed the generational expectations and differences that organizations should be aware of as the federal workforce begins to skew younger in age. The following checklist provides organizations with a starting point as they prepare for change within the federal IT workforce.

THE NET GENERATION TOP 20 "TO DO" LIST

1. Show that the organization understands their world.
2. Rethink authority and hierarchy within the organization.
3. Include Net-Geners in re-designing work practices.
4. Design jobs and work spaces to support collaboration.
5. Become social media savvy
6. Invest in technology to power high performance, creativity, and collaboration.
7. Examine how new technology is deployed within the organization.
8. Refresh organization websites and their capabilities.
9. Re-examine career paths for all generations.
10. Customize training programs for individual workers.
11. Encourage and incentivize Boomer and Net-Gen mentors.
12. Examine current and future supervisory bench strength.
13. Measure performance by productivity, not physical presence.
14. Retool performance recognition programs and provide more continuous feedback.
15. Create dynamic recruiting programs that employ a cross section of media.
16. Be authentic when recruiting; emphasize organization values and strengths.
17. Create a dynamic onboarding program.
18. Fund and use hiring flexibilities strategically.
19. Create a more flexible and fun working environment.
20. Craft lasting networking relationships with employees who leave the organization.

appendices

A

FY2008 Distribution of the Major Federal IT Population Across the Federal CIO Council Membership

Major Department/Agency CIO Council Members	2210	1550	0855	0854	0391
AID	64	1	0	0	0
Agriculture	3,443	6	31	1	107
Commerce	3,156	228	309	27	91
Defense	27,957	4,416	16,486	3,053	3,192
Education	208	1	0	0	1
Energy	630	24	108	13	19
EPA	652	7	0	5	7
GSA	654	0	7	0	168
HHS	2,425	176	67	28	367
Homeland Security	2,249	14	91	13	520
HUD	215	0	0	0	5
Interior	2,339	49	23	17	155
Justice	2,766	37	125	11	492
Labor	639	0	4	0	6
NASA	372	197	806	916	21
NRC	164	0	23	0	6
NSF	95	34	1	2	0
OMB	13	0	0	0	0
OPM	162	0	0	0	9
SBA	130	0	0	0	3
SSA	3,683	0	0	0	6
State	649	3	9	0	105
Transportation	1,821	168	893	68	75
Treasury	6,528	28	8	36	168
VA	5,702	4	4	6	185
Total	66,716	5,393	18,995	4,196	5,708
Non-Council Agencies	1,910	11	307	7	79
Grand Total	**68,626**	**5,404**	**19,302**	**4,203**	**5,787**

Data Source: Appendix A was compiled using publicly available federal IT workforce data from www.fedscope.opm.gov.

B

2210 Community: Personnel Strength and Turnover Rates by Generational Age Group

IT Management	2003	2004	2005	2006	2007	2008
EOY Personnel Strength (Age: 20–29)	2,294	2,593	2,874	3,030	2,896	3,144
All Agency Separations	217	261	292	374	417	336
Gross Turnover Rate	-	10.7%	10.7%	12.7%	14.1%	11.1%
Federal Service Separations	153	233	252	315	348	271
Net Turnover Rate	-	9.5%	9.2%	10.7%	11.7%	9.0%
EOY Personnel Strength (Age: 30–44)	22,220	22,220	21,889	21,864	20,833	20,564
All Agency Separations	1,314	942	1,028	1,130	1,130	1,083
Gross Turnover Rate	-	4.2%	4.7%	5.2%	5.3%	5.2%
Federal Service Separations	471	622	696	680	735	664
Net Turnover Rate	-	2.8%	3.2%	3.1%	3.4%	3.2%
EOY Personnel Strength (Age: 45 and up)	38,279	39,924	41,059	42,920	43,481	44,918
All Agency Separations	3,317	3,006	3,425	3,447	3,424	3,356
Gross Turnover Rate	-	7.7%	8.5%	8.2%	7.9%	7.6%
Federal Service Separations	2210	2,658	3,070	2,882	2,944	2,834
Net Turnover Rate	-	6.8%	7.6%	6.9%	6.8%	6.4%
EOY Total Strength (All Ages)	62,793	64,737	65,822	67,814	67,210	68,626
All Agency Separations	4,848	4,209	4,745	4,951	4,971	4,775
Gross Turnover Rate	-	6.6%	7.3%	7.4%	7.4%	7.0%
Federal Service Separations	2,834	3,513	4,018	3,877	4,027	3,769
Net Turnover Rate	-	5.5%	6.2%	5.8%	6.0%	5.5%

Turnover Rate Calculations: The turnover rates calculated in Appendix B were derived by dividing annual losses by average personnel strength (adding the beginning and end of fiscal year personnel strength, and dividing by two). Gross turnover is the rate of total movement within the workforce, i.e., both separations from federal service and agency transfers. This number is useful since it describes the "total churn" within the Major Federal IT Population. Net turnover calculates the more typical turnover rate, which is based solely on separations from federal service.

The source of this data was the online Office of Personnel Management tool, FedScope. Since the data within Fedscope is aggregated differently than the age ranges of the Net Generation and Generation X as stated within this guide, the Net-Gen population is slightly understated in number and the Gen X population number is slightly overstated. Additionally, it is recognized that a small number of individuals will cross into a new generation during the fiscal year by turning a year older. These differences should not significantly impact the general turnover trends.

B

1550 Community: Personnel Strength and Turnover Rates by Generational Age Group

Computer Science	2003	2004	2005	2006	2007	2008
EOY Personnel Strength (Age: 20–29)	817	898	961	962	966	932
All Agency Separations	35	70	81	114	86	82
Gross Turnover Rate	-	8.2%	8.7%	11.9%	8.9%	8.6%
Federal Service Separations	33	68	79	103	75	75
Net Turnover Rate	-	7.9%	8.5%	10.7%	7.8%	7.9%
EOY Personnel Strength (Age: 30–44)	2,043	2,018	1,935	1,859	1,779	1,820
All Agency Separations	48	55	87	78	76	91
Gross Turnover Rate	-	2.7%	4.4%	4.1%	4.2%	5.1%
Federal Service Separations	30	37	59	68	58	76
Net Turnover Rate	-	1.8%	3.0%	3.6%	3.2%	4.2%
EOY Personnel Strength (Age: 45 and up)	1,994	2,048	2,207	2,374	2,471	2,652
All Agency Separations	92	112	127	139	133	143
Gross Turnover Rate	-	5.5%	6.0%	6.1%	5.5%	5.6%
Federal Service Separations	83	100	118	123	118	119
Net Turnover Rate	-	4.9%	5.5%	5.4%	4.9%	4.6%
EOY Total Strength (All Ages)	4,854	4,964	5,103	5,195	5,216	5,404
All Agency Separations	175	237	295	331	295	316
Gross Turnover Rate	-	4.8%	5.9%	6.4%	5.7%	6.0%
Federal Service Separations	146	205	256	294	251	270
Net Turnover Rate	-	4.2%	5.1%	5.7%	4.8%	5.1%

B

0855 Community: Personnel Strength and Turnover Rates by Generational Age Group

Electronics Engineering	2003	2004	2005	2006	2007	2008
EOY Personnel Strength (Age: 20–29)	1,737	1,951	2,128	2,171	2,209	2,273
All Agency Separations	59	82	140	159	161	154
Gross Turnover Rate	-	4.4%	6.9%	7.4%	7.4%	6.9%
Federal Service Separations	54	73	126	146	135	127
Net Turnover Rate	-	4.0%	6.2%	6.8%	6.2%	5.7%
EOY Personnel Strength (Age: 30–44)	9,474	8,550	7,913	7,073	6,347	5,761
All Agency Separations	183	201	228	176	190	156
Gross Turnover Rate	-	2.2%	2.8%	2.3%	2.8%	2.6%
Federal Service Separations	106	140	171	121	124	98
Net Turnover Rate	-	1.6%	2.1%	1.6%	1.8%	1.6%
EOY Personnel Strength (Age: 45 and up)	9,440	9,575	10,171	10,487	10,819	11,268
All Agency Separations	651	621	674	675	635	681
Gross Turnover Rate	-	6.5%	6.8%	6.5%	6.0%	6.2%
Federal Service Separations	579	581	636	631	575	617
Net Turnover Rate	-	6.1%	6.4%	6.1%	5.4%	5.6%
EOY Total Strength (All Ages)	20,651	20,076	20,212	19,731	19,375	19,302
All Agency Separations	893	904	1,042	1,010	986	991
Gross Turnover Rate	-	4.4%	5.2%	5.1%	5.0%	5.1%
Federal Service Separations	739	794	933	898	834	842
Net Turnover Rate	-	3.9%	4.6%	4.5%	4.2%	4.4%

B

0854 Community: Personnel Strength and Turnover Rates by Generational Age Group

Computer Engineering	2003	2004	2005	2006	2007	2008
EOY Personnel Strength (Age: 20–29)	655	848	922	881	898	901
All Agency Separations	21	37	40	56	62	63
Gross Turnover Rate	-	4.9%	4.5%	6.2%	7.0%	7.0%
Federal Service Separations	20	36	40	48	55	54
Net Turnover Rate	-	4.8%	4.5%	5.3%	6.2%	6.0%
EOY Personnel Strength (Age: 30–44)	1,779	1,768	1,704	1,575	1,445	1,392
All Agency Separations	44	28	42	50	42	54
Gross Turnover Rate	-	1.6%	2.4%	3.0%	2.8%	3.8%
Federal Service Separations	26	21	29	36	29	37
Net Turnover Rate	-	1.2%	1.7%	2.2%	1.9%	2.6%
EOY Personnel Strength (Age: 45 and up)	1,238	1,359	1,475	1,602	1,782	1,910
All Agency Separations	44	53	90	87	76	85
Gross Turnover Rate	-	4.1%	6.4%	5.7%	4.5%	4.6%
Federal Service Separations	42	49	84	72	55	77
Net Turnover Rate	-	3.8%	5.9%	4.7%	3.3%	4.2%
EOY Total Strength (All Ages)	3,672	3,975	4,101	4,058	4,125	4,203
All Agency Separations	109	118	172	193	180	202
Gross Turnover Rate	-	3.1%	4.3%	4.7%	4.4%	4.9%
Federal Service Separations	88	106	153	156	139	168
Net Turnover Rate	-	2.8%	3.8%	3.8%	3.4%	4.0%

B

0391 Community: Personnel Strength and Turnover Rates by Generational Age Group

Telecommunications Management	2003	2004	2005	2006	2007	2008
EOY Personnel Strength (Age: 20–29)	109	118	133	170	180	189
All Agency Separations	30	27	26	33	66	47
Gross Turnover Rate	-	23.8%	20.7%	21.8%	37.7%	25.5%
Federal Service Separations	16	26	23	31	46	45
Net Turnover Rate	-	22.9%	18.3%	20.5%	26.3%	24.4%
EOY Personnel Strength (Age: 30–44)	1,709	1,683	1,651	1,631	1,572	1,560
All Agency Separations	243	99	90	97	172	90
Gross Turnover Rate	-	5.8%	5.4%	5.9%	10.7%	5.7%
Federal Service Separations	57	72	72	70	69	65
Net Turnover Rate	-	4.2%	4.3%	4.3%	4.3%	4.2%
EOY Personnel Strength (Age: 45 and up)	4,141	4,037	4,048	4,016	3,942	4,038
All Agency Separations	630	365	375	385	493	315
Gross Turnover Rate	-	8.9%	9.3%	9.5%	12.4%	7.9%
Federal Service Separations	285	320	342	355	293	278
Net Turnover Rate	-	7.8%	8.5%	8.8%	7.4%	7.0%
EOY Total Strength (All Ages)	5,959	5,838	5,832	5,817	5,694	5,787
All Agency Separations	903	491	491	515	731	452
Gross Turnover Rate	-	8.3%	8.4%	8.8%	12.7%	7.9%
Federal Service Separations	358	418	437	456	408	388
Net Turnover Rate	-	7.1%	7.5%	7.8%	7.1%	6.8%

C

FY2008: Average Salary by Community and Generation

New Hires	Net-Gen 20–24	Net-Gen 25–29	Gen X 30–34	Gen X 35–39	Gen X 40–44	Boomer 45–49	Boomer 50–54	Boomer 55–59	Boom+ 60–64	Boom+ 65+
2210	$49K	$60.8K	$70.2K	$77.6K	$77.7K	$80.6K	$85.1K	$81.9K	$82.7K	$74.5K
1550	$52.1K	$60.9K	$71.3K	$84.3K	$88.4K	$92.3K	$102.5K	$98.3K	$95K	$104.3K
0855	$51.6K	$58.4K	$64.7K	$74.5K	$85.4K	$89.8K	$88.9K	$106.4K	$109.3K	$116.1K
0854	$54.2K	$59.2K	$76.4K	$86K	$94.1K	$107.1K	$96.3K	$124.8K	$0K	$101K
0391	$46.3K	$54.1K	$62.5K	$66.5K	$66.6K	$70.4K	$72.2K	$63.9K	$68.3K	$78.1K

On Board	Net-Gen 20–24	Net-Gen 25–29	Gen X 30–34	Gen X 35–39	Gen X 40–44	Boomer 45–49	Boomer 50–54	Boomer 55–59	Boom+ 60–64	Boom+ 65+
2210	$50.2K	$64.6K	$73.6K	$81.7K	$86.3K	$88.9K	$91.2K	$93.2K	$93.4K	$95.8K
1550	$57.3K	$71.9K	$81.6K	$90.3K	$101.1K	$106.1K	$106.7K	$111.1K	$116.8K	$120.2K
0855	$55.6K	$70.1K	$79.6K	$90.5K	$102.9K	$107K	$106.7K	$109K	$111.5K	$113.4K
0854	$57.5K	$72.6K	$82.7K	$93.2K	$101.8K	$107.6K	$108.9K	$109K	$111.2K	$114.3K
0391	$46.3K	$56.6K	$64K	$73K	$76.3K	$80K	$82.2K	$85.1K	$87K	$88.6K

FY2008: Gender Representation by Community and Generation

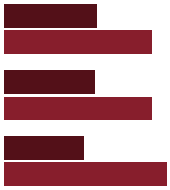
Community	Gender	Net-Gen 19–29	Gen X 30–44	Boomer/+ 45+	Total
IT Management - 2210	Male	72%	67%	72%	64%
	Female	28%	33%	38%	36%
Computer Science - 1550	Male	79%	70%	72%	72%
	Female	21%	30%	28%	28%
Electronics Engineering - 0855	Male	84%	86%	93%	90%
	Female	16%	14%	7%	10%
Computer Engineering - 0854	Male	86%	79%	82%	82%
	Female	14%	21%	18%	18%
Telecommunications Management - 0391	Male	84%	81%	79%	80%
	Female	16%	19%	21%	20%

Data Source: Appendix C was compiled using publicly available federal IT workforce data from www.fedscope.opm.gov.

C

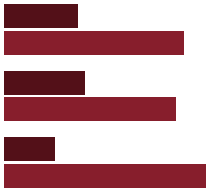
FY2008: 2210 Minority Representation by Generation

Net-Gen	Minority	36%
	Non-Minority	64%
Gen X	Minority	36%
	Non-Minority	64%
Boomer/+	Minority	29%
	Non-Minority	71%



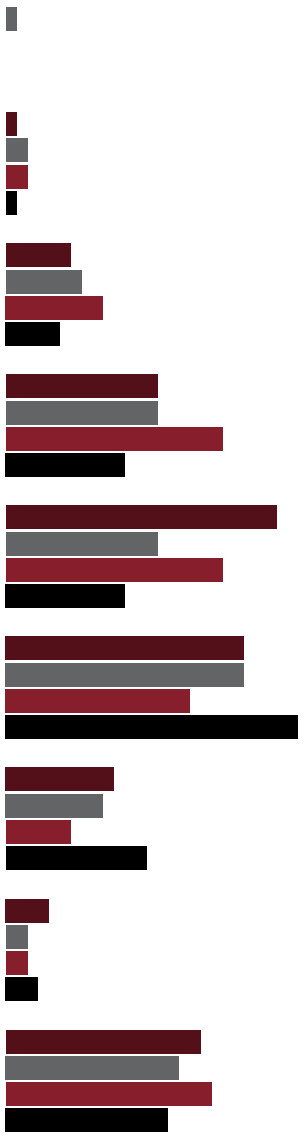
FY2008: 1550 Minority Representation by Generation

Net-Gen	Minority	29%
	Non-Minority	71%
Gen X	Minority	33%
	Non-Minority	67%
Boomer/+	Minority	21%
	Non-Minority	79%



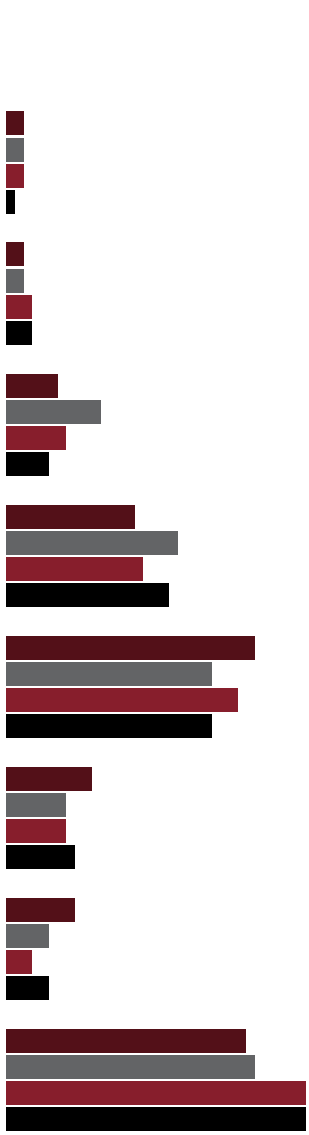
FY2008: 2210 Racial/Ethnic Population Distribution by Grade

GS5	White	0%
	Black	1%
	Hispanic	0%
	Asian	0%
GS7	White	1%
	Black	2%
	Hispanic	2%
	Asian	1%
GS9	White	6%
	Black	7%
	Hispanic	9%
	Asian	5%
GS11	White	14%
	Black	14%
	Hispanic	20%
	Asian	11%
GS12	White	25%
	Black	14%
	Hispanic	20%
	Asian	11%
GS13	White	22%
	Black	22%
	Hispanic	17%
	Asian	27%
GS14	White	10%
	Black	9%
	Hispanic	6%
	Asian	13%
GS15	White	4%
	Black	2%
	Hispanic	2%
	Asian	3%
N/A	White	18%
	Black	16%
	Hispanic	19%
	Asian	15%



FY2008: 1550 Racial/Ethnic Population Distribution by Grade

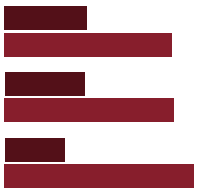
GS5	White	0%
	Black	0%
	Hispanic	0%
	Asian	0%
GS7	White	2%
	Black	2%
	Hispanic	2%
	Asian	1%
GS9	White	2%
	Black	2%
	Hispanic	3%
	Asian	3%
GS11	White	6%
	Black	11%
	Hispanic	7%
	Asian	5%
GS12	White	15%
	Black	20%
	Hispanic	16%
	Asian	19%
GS13	White	29%
	Black	24%
	Hispanic	27%
	Asian	24%
GS14	White	10%
	Black	7%
	Hispanic	7%
	Asian	8%
GS15	White	8%
	Black	5%
	Hispanic	3%
	Asian	5%
N/A	White	28%
	Black	29%
	Hispanic	35%
	Asian	35%



C

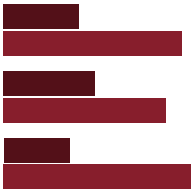
FY2008: 0855 Minority Representation by Generation

Net-Gen	Minority	34%
	Non-Minority	66%
Gen X	Minority	33%
	Non-Minority	67%
Boomer +	Minority	24%
	Non-Minority	76%



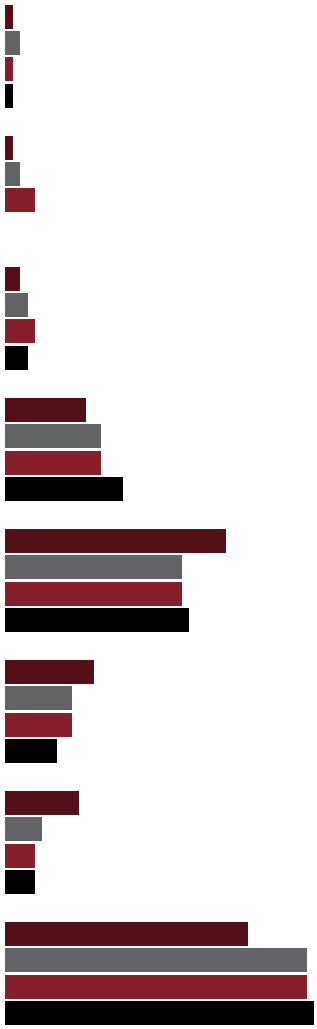
FY2008: 0854 Minority Representation by Generation

Net-Gen	Minority	29%
	Non-Minority	71%
Gen X	Minority	38%
	Non-Minority	62%
Boomer +	Minority	26%
	Non-Minority	74%



FY2008: 0855 Racial/Ethnic Population Distribution by Grade

GS5	White	0%
	Black	0%
	Hispanic	0%
	Asian	0%
GS7	White	1%
	Black	2%
	Hispanic	1%
	Asian	1%
GS9	White	1%
	Black	2%
	Hispanic	4%
	Asian	0%
GS11	White	2%
	Black	3%
	Hispanic	4%
	Asian	3%
GS12	White	11%
	Black	13%
	Hispanic	13%
	Asian	16%
GS13	White	30%
	Black	24%
	Hispanic	24%
	Asian	25%
GS14	White	12%
	Black	9%
	Hispanic	9%
	Asian	7%
GS15	White	10%
	Black	5%
	Hispanic	4%
	Asian	4%
N/A	White	33%
	Black	41%
	Hispanic	41%
	Asian	42%



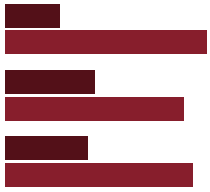
FY2008: 0854 Racial/Ethnic Population Distribution by Grade

GS5	White	0%
	Black	0%
	Hispanic	0%
	Asian	0%
GS7	White	2%
	Black	0%
	Hispanic	2%
	Asian	2%
GS9	White	2%
	Black	1%
	Hispanic	0%
	Asian	2%
GS11	White	4%
	Black	7%
	Hispanic	5%
	Asian	5%
GS12	White	19%
	Black	20%
	Hispanic	27%
	Asian	28%
GS13	White	32%
	Black	32%
	Hispanic	27%
	Asian	31%
GS14	White	12%
	Black	13%
	Hispanic	7%
	Asian	9%
GS15	White	8%
	Black	7%
	Hispanic	4%
	Asian	4%
N/A	White	20%
	Black	20%
	Hispanic	29%
	Asian	18%

C

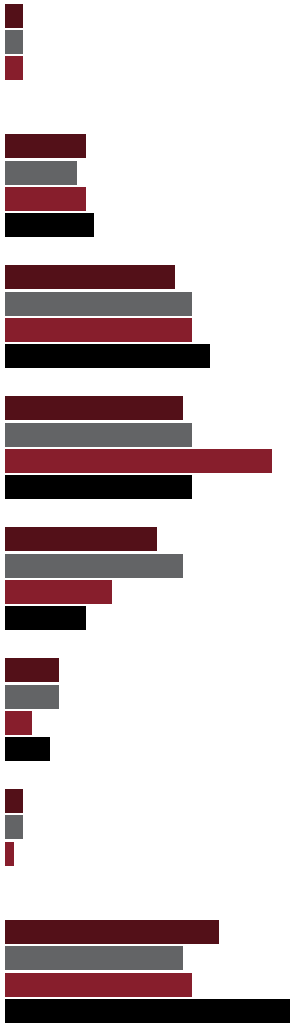
FY2008: 0391 Minority Representation by Generation

Net-Gen	Minority	24%
	Non-Minority	76%
Gen X	Minority	30%
	Non-Minority	70%
Boomer +	Minority	29%
	Non-Minority	71%



FY2008: 0391 Racial/Ethnic Population Distribution by Grade

GS5	White	0%
	Black	0%
	Hispanic	0%
	Asian	0%
GS7	White	2%
	Black	2%
	Hispanic	2%
	Asian	0%
GS9	White	9%
	Black	8%
	Hispanic	9%
	Asian	10%
GS11	White	19%
	Black	21%
	Hispanic	21%
	Asian	23%
GS12	White	20%
	Black	21%
	Hispanic	30%
	Asian	21%
GS13	White	17%
	Black	20%
	Hispanic	12%
	Asian	9%
GS14	White	6%
	Black	6%
	Hispanic	3%
	Asian	5%
GS15	White	2%
	Black	2%
	Hispanic	1%
	Asian	0%
N/A	White	24%
	Black	20%
	Hispanic	21%
	Asian	32%



D

IT Occupational Forecast for 2018

Department of Labor Occupation	Description	Job Titles	Related Series	Education Requirement
Computer and Information Systems Managers	Plan, coordinate, and direct research and facilitate the computer-related activities of the organization. Manage technology implementation, business planning, network security, and IT operations.	IT Directors or Managers, Chief Technology Officers, Management Information Systems Directors, Project Managers, Information Security Managers or Specialists, Network Managers	2210, 1550, 0854	Usually requires a bachelor's degree, and often, a graduate degree is preferred for management positions. Wide variety of certifications available.
Computer Operators	Oversee the operation of computer hardware systems, ensuring that machines run efficiently and securely.	Computer Operators	0332	Typically requires on-the-job training.
Computer Programmers	Write, test, and maintain detailed computer instructions as well as design and test logical structures for solving problems. Programmers often are identified by the function they perform or environment in which they work.	Application Programmers, Systems Programmers, Programmer-Analysts	2210, 1550, 0854	In 2006, more than 68% of computer programmers had a bachelor's degree or higher. This percent is expected to increase.

Data Source: Appendix D was compiled using data from U.S. Department of Labor, Bureau of Labor Statistics, *Occupational Outlook Handbook, 2008–2009 and 2010–2011 Editions*

D

Near to Long Term Knowledge and Skill Requirements	2008 Employment	Projected 2018 Employment	Employment Change by 2018	Long Term Job Prospects
Advanced technical knowledge in web applications and Internet technologies. Business insight. Knowledge of security to be able to protect infrastructure and Internet sites. Keen understanding of people, management, processes, and customers' needs. Specialized technical knowledge. Strong communications skills, management skills and an understanding of business practices and principles. Strong interpersonal and leadership skills.	293,000	342,500	Increase 17%, growth faster than average.	Excellent, closely related to the growth of the occupations they supervise.
Familiar with a variety of operating systems and knowledge of the latest technology, analytical and communication skills. Able to work independently. Automation of routine tasks will shift work responsibilities to network operations, user support, and database maintenance areas.	110,000	89,500	Rapidly declining by 19%.	Face the higher competition for fewer openings that will require more highly skilled work as many routine tasks are automated. Advances in technology will continue to eliminate the need for human interaction.
Knowledge of a variety of operating systems, able to configure and adapt operating systems. Able to work with database systems (i.e., DB2, Oracle, or Sybase) and object-oriented languages and tools (i.e., C++, Java). Familiar with 4th and 5th generation languages, computer-assisted software engineering (CASE) tools, and multimedia technology. Attention to detail. Teamwork, communication, business, and analytical skills. Knowledge of the latest technology to include programming languages and techniques that apply to computer networking, database management and Internet application development. Able to support data communications and help implement business strategies in client/server, Web-based, and wireless environments. Knowledge of digital security issues and skilled in applying security technology.	426,700	414,000	Slow decline by 3%.	Numerous openings will result from the need to replace programmers. The consolidation and centralization of systems and applications, developments in packaged software, advances in programming languages and tools, and the rising ability of users able to design, write, and implement their own programs; will mean that more programming functions can be performed by other types of information workers. Has the higher risk of offshore outsourcing.

D

Department of Labor Occupation	Description	Job Titles	Related Series	Education Requirement
Computer Scientists and Database Administrators	Work supports new areas of specialization or changes that result from rapidly and continually evolving technology.	Computer Scientists, Database Administrators, Network Systems and Data Communications Analysts, Network Architects, Internet Developers, Web Developers, Web Designers, Webmasters	1550, 0854, 2210	Prerequisite for many jobs is a bachelor's degree, but some jobs may require only a 2-year degree. Computer Scientists in the research area may require a Ph.D.

Computer Scientists and Database Administrators Subgroup	Description
Computer and Information Scientists, Research	*Work as theorists, researchers, or inventors. Work requires higher level of theoretical expertise and innovation to address complex problems and the creation or application of new technology.*
Database Administrators	*Work with database management systems software and determine ways to organize and store data.*
Network Systems and Data Communications Analysts	*Design, test, and evaluate systems and networks, and other data communications systems. Perform network modeling, analysis, and planning, often requiring both hardware and software solutions.*
Computer Specialists, all other	*Work may include: Integrate computer and communications equipment. Design voice and data communications systems. Supervise the installation of systems, and provide maintenance and other services. Design, develop, and maintain websites and servers.*

D

Near to Long Term Knowledge and Skill Requirements	2008 Employment	Projected 2018 Employment	Employment Change by 2018	Long Term Job Prospects
Knowledgeable about network, data, and communications security. Skilled in developing and supporting Internet and intranet applications. Ability to apply technology to more effectively communicate with employees, clients, and consumers. Broad knowledge of computer systems and technologies, business management, strong problem-solving and analytical skills, interpersonal and team skills, physical sciences, mathematics, engineering, graphic design.	650,600	865,200	Increase of 33%, growth much faster than average.	Excellent job prospects as demand increases to facilitate sharing information and protecting systems and networks caused by expansion of electronic commerce and greater need to safeguard information.
	28,900	*35,900*	Computer and Information Scientists, Research (Increase of 24%).	
	120,400	*144,700*	Database Administrators (Increase of 20%).	
	292,000	*447,800*	Network Systems and Data Communications Analysts (Increase of 53%).	
	209,300	*236,800*	Computer Specialists, all other (Increase of 13%).	

D

Department of Labor Occupation	Description	Job Titles	Related Series	Education Requirement
Computer Software Engineers	Apply the principles of computer science and mathematical analysis to the design, development, testing, and evaluation of the software and systems that make computers work. As technology evolves, so too do new areas of specialization.	Computer Applications Software Engineers, Computer Systems Software Engineers)	0854	At least a bachelor's degree in computer engineering, computer science, or computer information systems. Some vendor certifications available.

Computer Software Engineers Subgroup	Description
Computer Applications Software Engineers	*Work involves the user needs analysis, design, development, and maintenance of general computer applications software or specialized utility program, which may include package systems or systems software or creation of customized applications.*
Computer Systems Software Engineers	*Work involves the coordination of development, maintenance, protection, and expansion of an organization's computer systems, which may include intranets.*

Computer Support Specialists and Systems Administrators	Work involves providing advice to users, day-to-day administration, maintenance, and support of computer systems and networks.	Computer Support Specialists, Technical Support Specialists, Helpdesk Technicians, Network and Computer Systems Administrators, Systems Administrators, Computer Security Specialists	2210, 0335, 0332	Greater prospects for college graduates with degrees in computer science or information systems. Demand for strong computer skills will continue to qualify entry-level positions without college degrees. Certifications are essential.

D

Near to Long Term Knowledge and Skill Requirements	2008 Employment	Projected 2018 Employment	Employment Change by 2018	Long Term Job Prospects
Knowledge of the latest technology. Strong programming, systems analysis, interpersonal, business, problem-solving, and analytical skills. Ability to effectively communicate. Skills in the industry in which they work. Internet, intranet, and web applications. Ability to implement, safeguard, and update computer systems and resolve problems. Skills to support the new growth areas stemming from the increasing uses of the Internet, the proliferation of websites, mobile technology, hand-held computers, and wireless networks. Skills to support the integration of current computer systems with new, more mobile technology. Strong business skills and training could lead to a career progression of project manager, information systems manager, and/or CIO positions.	909,600	1,204,800	Increase of 32%, growth much faster than the average.	Excellent, largest employment increase of any occupation spurred by the creation of sophisticated technological innovations. Though outsourcing may temper the growth, the occupation is less vulnerable to outsourcing as the work requires innovation and intense research and development.
	514,800	*689,900*	Computer Applications Software Engineers (Increase of 34%).	
	394,800	*515,000*	Computer Systems Software Engineers (Increase of 30%).	
Latest technological skills. Strong fundamental computer skills combined with good interpersonal and communication skills. Knowledge of new mobile technologies. Skills in safeguarding data, systems, and networks. Wide skill requirement is expected as the increasing use of electronic commerce and adoption of mobile technologies will require support to help use new technology to communicate with employees and customers.	905,200	1,062,100	Increase of 17%, growth much faster than the average.	Demand will grow as new technologies and the security of data and systems increases, generating many new systems administrator jobs. The demand may be tempered for network and computer systems administrators by off-shore outsourcing as technology will increasingly enable computer systems to be managed remotely.

D

Department of Labor Occupation	Description	Job Titles	Related Series	Education Requirement
Computer Support Specialists and System Administators Subgroup	Description			
Computer Support Specialist: Technical Support Specialists, Helpdesk Technicians	*Provide technical assistance, support, and advice to customers. May install, modify, clean, and repair computer hardware and software as well as support user training.*			
Network and Computer System Administrators: System Administrators, Computer Security Specialists	*Design, install, and support an organization's computer systems, local-area networks, wide-area networks, network segments, and Internet and Intranet systems. May plan, coordinate, and implement network security measures, including user security training.*			
Computer Systems Analysts	Work related to solving computer problems and use of computer technology to meet the needs of an organization. Systems architects help an organization select the proper systems software and infrastructure. Systems designers develop and fine-tune systems. Software quality assurance analysts do more in-depth testing as they work with programmers to eliminate errors.	Computer Systems Analyst, System Architects, Systems Designers, Software Quality Assurance Analysts	2210, 1550, 0854	Preference is at least a bachelor's degree. If in a technical environment, may need a degree in computer science, information science, applied mathematics, engineering, or the physical sciences. If in a business environment, may need a degree in management information systems or a master's degree in business administration with a concentration in information systems. For more technically complex jobs, a graduate degree is preferred.
Top Executives (includes Chief Information Officer (CIO) as well as Chief Executive Officer, Chief Operating Officer, Chief Financial Officer, General and Operations Manager)	Chief Information Officer: Responsible for the overall technological direction of their organization and involved in strategic business planning.	Chief Information Officer (also Chief Executive Officer, Chief Operating Officer, Chief Financial Officer, General and Operations Manager)	2210, and other series	Formal education required.

D

Near to Long Term Knowledge and Skill Requirements	2008 Employment	Projected 2018 Employment	Employment Change by 2018	Long Term Job Prospects
	565,700	*643,700*	Computer Support Specialist (Increase of 14%).	
	339,500	*418,400*	Network and Computer System Administrators (Increase of 23%).	
Latest technical skills, especially in information security. Knowledgeable about systems integration and network, data, and communications security. Good interpersonal and business skills. In addition to the latest technical skills, the ability to integrate Internet, wireless, and mobile computer technologies into business is increasing as is the information security. Strong leadership and business skills could lead to a career progression of information systems manager and/or CIO positions.	532,200	640,300	Increase by 20%, growth much faster than the average.	Very good with strong job growth and need for replacement of workers. Growth may be tempered somewhat as jobs are outsourced.
	2,133,500 *Note: Specific numbers for CIOs are not available.*	2,125,700 *Note: Specific numbers for CIOs are not available.*	Little to no change	Keen competition, many executives who leave their jobs transfer to other executive positions that creates a barrier for new entrants.

E

FY2007: Time Off Awards by Federal CIO Council Membership

Major Dept/ Agency Members of the CIO Council*	Individual Time Off Awards	Rate/100 Employees (in hours)	Average Award Amount in Hours	Group Time Off Awards	Rate/100 Employees (in hours)	Average Award Amount in hours
AID	47	1.9	13.1	0	0	0
Agriculture	7,649	7.5	16.9	1,977	1.9	12.3
Commerce	1,270	3.1	12.8	259	0.6	13.4
Department of the Air Force	76,645	56.9	19.0	15,851	11.8	8..7
Department of the Army	43,265	20.4	19.7	645	0.3	14.2
Department of the Navy	20,578	11.9	14.9	14,559	8.4	11.0
Education	219	5.0	12.0	114	2.6	8.2
Energy	1,238	8.3	18.9	1,091	7.3	14.8
EPA	5,667	31.3	17.3	875	4.8	7.8
GSA	42	0.3	21.5	260	2.2	8.5
HHS	7,908	7.5	16.9	2,075	3.1	11.5
Homeland Security	27,797	16.7	14.7	3,501	2.1	12.3
HUD	2,437	25.1	13.1	93	1.0	10.5
Interior	10,315	14.4	16.3	1,445	2.0	6.2
Justice	22,684	21.4	13.8	4,175	3.9	12.0
Labor	2,384	15.5	10.6	3	<0.1	16.0
NASA	3,324	18.1	16.8	1,345	7.3	136
NRC	187	5.1	16.0	85	2.3	10.0
NSF	0	0	0	0	0	0
OMB	0	0	0	0	0	0
OPM	116	2.1	12.9	17	0.3	8.9
SBA	1,298	25.1	9.2	0	0	0
SSA	28	<0.1	2.3	0	0	0
State	118	1.1	21.8	9	0.1	15.1
Transportation	1,053	11.7	17.6	536	6.0	12.9
Treasury	12,430	11.3	34.3	575	0.5	13.0
VA	7,522	3.1	8.4	13,964	5.7	7.0

*Agencies with populations of less than 1,501 were not listed separately and Department of Defense data was not aggregated in the OPM Federal Awards Statistics for Fiscal Year 2007 report (the latest available report as of publication of this guide). Additionally, this OPM report does not provide data by occupational series.

F

FY2007: Loan Repayment Program (LRP) Statistics by Federal CIO Council Membership

Major Dept/Agency CIO Council Members*	Average FY2007 Payment	Total LRP Recipients	2210 or 2299	1550	0855	0854	0391	% of IT LRP Recipients
AID								
Agriculture	$7,626	53	1		1			2%
Commerce	$6,535	3						0%
Defense	$3,378	1,860	86	19	90	32		12%
Education	$5,488	4						
Energy	$6,767	68		1	1			3%
EPA	$5,598	14						0%
GSA	$7,677	9	1					11%
HHS	$7,680	144						0%
Homeland Security	$7,813	71	1					1%
HUD	$3,342	179	6					3%
Interior	$8,292	41	3					7%
Justice	$8,347	2,463	75	2	1		9	4%
Labor	$5,279	36	1					3%
NASA	$6,794	38						0%
NRC	$9,192	15						0%
NSF								
OMB								
OPM	$3,333	6						0%
SBA								
SSA								
State**	$5,976	626	21					3%
Transportation	$9,226	36	1					3%
Treasury	$5,115	26	9					35%
VA***	$7,716	129	13					10%

*The average payment across the entire Federal Government was $6,377.
**The State Department also provided loan repayment benefits to 16 Information Management (FS-2880) and 1 Information Management Tech (FS-2882) individuals.
***The VA also has separate student loan authority repayment authority under 38 USC 7681 for certain healthcare occupations.

Data Source: *Federal Student Loan Repayment Program Fiscal Year 2007 Report to Congress* by the Office of Personnel Management.

F

CY2008: Loan Repayment Program (LRP) Statistics by Federal CIO Council Membership

Major Dept/Agency CIO Council Members	Average CY2007 Payment*	Total LRP Recipients	2210 or 2299	1550	0855	0854	0391	% of IT LRP Recipients
AID	$7,237	114						0%
Agriculture	$7,596	48	2					4%
Commerce	$7,505	10		1				10%
Defense	$6,063	1,286	15	13	55	18		8%
Education	$5,333	3						
Energy	$4,999	105	3		2			5%
EPA	$5,683	15	1					6%
GSA	$6,233	64	2					3%
HHS	$7,590	287	2					0.7%
Homeland Security	$7,546	80	5					6%
HUD	$2,752	251	4					2%
Interior	$6,997	60	4					7%
Justice	$8,973	2,610	71	2	4		5	3%
Labor	$7,335	3						
NASA	$5,052	7						
NRC	$9,115	21						
NSF								
OMB								
OPM	$8,500	4						
SBA								
SSA								
State**	$6,442	713	19					3%
Transportation	$9,797	37	1					3%
Treasury	$4,593	51	9					18%
VA	$8,056	130	18					14%

*The average payment across the entire Federal Government was $7,511.
**The State Department also provided loan repayment benefits to 15 Information Management (FS-2880), 1 Information Management Tech (FS-2882) and 2 Information Tech Management (FS-2884) individuals.

Data Source: *Federal Student Loan Repayment Program Calendar Year 2008 Report to Congress* by the Office of Personnel Management.

G

CY2007: Recruitment Incentives by Federal CIO Council Membership

Major Dept/ Agency Members of the CIO Council	Total Recruitment Bonus Recipients	2210 or 2299	1550	0855	0854	0391
AID						
Agriculture	368	1				
Commerce	957	18	2	1	1	
Defense	4,033	56	64	317	43	6
Education	1					
Energy	85	3				
EPA	17	1				
GSA	10					
HHS	349	2				
Homeland Security	108	1				
HUD	1					
Interior	46	1				
Justice	240	11	2			
Labor	27	3				
NASA	64	1		2	3	
NRC						
NSF						
OMB						
OPM	2					
SBA						
SSA	4	2				
State						
Transportation	41	1				
Treasury	34	2				
VA	1,223	3				

There were 5,658 recruitment incentives paid to individuals in the General Schedule; another 2,158 awards were received by individuals across 42 other pay plans.

Data Source: *Recruitment, Relocation, and Retention Incentives Calendar Year 2007 Report to Congress* by the Office of Personnel Management.

G

CY2007: Retention Incentives by Federal CIO Council Membership

Major Dept/ Agency Members of the CIO Council	Total Retention Bonus Recipients	2210 or 2299	1550	0855	0854	0391
AID	33	32	1			
Agriculture	96	1				
Commerce	173	3	3	7	2	1
Defense	11,058	335	145	2,299	28	66
Education						
Energy	136			1	1	
EPA	15	5			1	
GSA	20	10				
HHS	2,098	55	2	2	1	
Homeland Security	656	3				1
HUD	3					
Interior	91	3				
Justice	1,528	17	2	4		1
Labor	5	2				
NASA	13					
NRC						
NSF						
OMB						
OPM	1					
SBA						
SSA	4	3				
State*	1,038	285	2			18
Transportation	11	1				
Treasury		118	40			
VA	5,606	31			1	1

*The State Department also provided retention bonuses to 372 Information Management (FS-2880), 78 Information Management Tech (FS-2882), and 138 IT Management (FS-2884) personnel.

G

CY2007: Relocation Incentives by Federal CIO Council Membership

Major Dept/ Agency Members of the CIO Council	Total Relocation Bonus Recipients	2210 or 2299	1550	0855	0854	0391
AID						
Agriculture	77	2				
Commerce	11	2				
Defense	1,093	31	5	26	3	1
Education						
Energy	22	2			1	
EPA						
GSA	19					
HHS	141	1				
Homeland Security	21	2				
HUD	2					
Interior	31	1				
Justice	145	2				
Labor	7					
NASA	21					
NRC						
NSF						
OMB						
OPM	1					
SBA						
SSA						
State						
Transportation	3	1				
Treasury	25					
VA	350	8				

G

CY2008: Recruitment Incentives by Federal CIO Council Membership

Major Dept/ Agency Members of the CIO Council	Total Recruitment Bonus Recipients	2210 or 2299	1550	0855	0854	0391
AID	1					
Agriculture	297	5				
Commerce	1,402	27	1			
Defense	5,455	111	84	327	69	2
Education						
Energy	163	2				
EPA	19					
GSA	7					
HHS	527	3				
Homeland Security	240	11				1
HUD						
Interior	54	4				
Justice	607	11		3		2
Labor	29					
NASA	86	2		2	1	
NRC						
NSF	2					
OMB						
OPM	4					
SBA	1					
SSA	3	3				
State						
Transportation	39	1				
Treasury	160	4	1			
VA	2,131	8				1

The Office of Personnel Management (OPM) publicly released the *Recruitment, Relocation and Retention Incentives Calendar Year 2008 Report to the Congress* in March 2010, too late to include the data within Chapter 2 of this guide. These tables, based on the 2008 report, are provided as supplemental information.

There were 11,396 recruitment incentives paid in CY2008, a 46% increase from CY2007 in total awards received. A total of 199 incentives were paid to individuals in the 2210 series (versus 108 paid in CY2007), with 4% of new hires receiving an award. Forty-one percent of newly hired Computer Scientists received a recruitment incentive in CY2008 (up from 17% in 2007), while 36% (332) of new Electronics Engineers and 26% (70) of Computer Engineers did so.

G

CY2008: Retention Incentives by Federal CIO Council Membership

Major Dept/ Agency Members of the CIO Council	Total Retention Bonus Recipients	2210 or 2299	1550	0855	0854	0391
AID	8	6	1			
Agriculture	91	6				
Commerce	193	3	8	6	2	
Defense*	11,815	437	109	1,354	27	86
Education						
Energy	347			1	1	
EPA	13	5				
GSA	19	8				
HHS	1,971	54	3	2	1	
Homeland Security	25	5				
HUD	1					
Interior	84	4				1
Justice	2,158	21	1	3		10
Labor	12	4				
NASA	20			1		
NRC						
NSF						
OMB						
OPM						
SBA						
SSA	4	4				
State**	1,071	235				12
Transportation	21	4				
Treasury	130	24				
VA	6,713	107			1	1

There were 24,808 retention incentives received in 2008. In the 2210 community, 970 individuals received an award, an increase of 139 over CY2007. In the Electronics Engineering 0855 series, 1,362 engineers received a retention incentive, down from 2,314 recipients in 2007. The number of awards to other series in the Major Federal IT Community remained small.

*DoD data for the 0855 series was extrapolated, due to a missing data field on page 75 of the 2008 OPM report.
**The State Department also proved retention incentives to 540 Information Management (FP-2880), 77 Information Management Tech (FP-2882), and 55 Information Tech Management (FP-2884) individuals.

G

CY2008: Relocation Incentives by Federal CIO Council Membership

Major Dept/ Agency Members of the CIO Council	Total Relocation Bonus Recipients	2210 or 2299	1550	0855	0854	0391
AID						
Agriculture	88	1				
Commerce	16	3				
Defense	2,123	71	18	64	19	6
Education						
Energy	47	2		1	1	
EPA	1					
GSA	13					
HHS	56	3				
Homeland Security	45				1	
HUD	2					
Interior	45	1				
Justice	238	6				
Labor	1					
NASA	21					
NRC						
NSF						
OMB						
OPM	1					
SBA	2					
SSA						
State						
Transportation	3					
Treasury	46	1				
VA	544	9				

H

FY2009 Distribution of the Major Federal IT Population Across the Federal CIO Council Membership

Major Department/Agency Members of the CIO Council	2210	1550	0855	0854	0391
AID	67	1	0	0	0
Agriculture	3,449	6	34	1	108
Commerce	3,333	232	303	27	84
Defense	30,121	4,787	16,870	3,204	3,297
Education	211	1	0	0	1
Energy	635	24	93	14	16
EPA	648	9	0	4	8
GSA	667	0	5	0	178
HHS	2,529	204	61	29	387
Homeland Security	2,546	15	97	14	570
HUD	218	0	0	0	5
Interior	2,381	63	23	18	162
Justice	2,955	47	126	10	511
Labor	696	0	2	0	7
NASA	374	188	838	904	20
NRC	173	0	25	0	8
NSF	99	38	1	2	0
OMB	12	0	0	0	0
OPM	160	0	0	0	8
SBA	126	0	0	0	4
SSA	3,911	4	0	0	6
State	653	3	8	0	107
Transportation	1,961	194	903	77	75
Treasury	6,426	34	7	34	156
VA	5,981	3	4	7	182
Total	70,382	5,853	19,400	4,345	5,900
Non-Council Agencies	1,975	12	295	9	89
Grand Total	**72,357**	**5,865**	**19,695**	**4,354**	**5,989**

Data Source: Appendix H was compiled using publicly available federal IT workforce data from www.fedscope.opm.gov.

H

FY2009 Personnel Update

	2210	1550	0855	0854	0391
Personnel Strength	72,357	5,865	19,695	4,354	5,989
% Change from FY2008	5.4%	8.5%	2.0%	3.6%	3.5%
New Hires	6,540	593	1,201	294	594
Agency Transfer-In	661	27	68	31	52
All Accessions	7,201	620	1,269	325	646
Quit	649	67	130	46	78
Retirement	1,682	45	308	35	151
Reduction in Force (RIF)	5	0	1	0	0
Termination or Removal	416	23	52	9	74
Death	132	4	29	3	12
Other Separation	1	0	0	0	0
Federal Service Separations	2,885	139	520	93	315
% Change from FY2008	-23.4%	-48.5%	-38.2%	-44.6%	-18.8%
Agency Transfer-Out	981	56	155	41	92
All Separations	3,866	195	675	134	407
Net Turnover Rate	4.1%	2.5%	2.7%	2.2%	5.3%
Gross Turnover Rate	5.5%	3.5%	3.5%	3.1%	6.9%

Turnover Rate Calculations: The turnover rates calculated in Appendix H were derived by dividing annual losses by average personnel strength (adding the beginning and end of fiscal year personnel strength, and dividing by two). Gross turnover is the rate of total movement within the force, i.e., both separations from federal service and agency transfers. This number is useful since it describes the "total churn" within the Major Federal IT Population. Net turnover calculates the more typical turnover rate, which is based solely on separations from federal service.

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